Kodak DryView
8900 Laser Imager
Customer First Manual

Visit Kodak on the Web at www.kodak.com

7F3681

Eastman Kodak Company
343 State Street
Rochester, NY 14650

© Eastman Kodak Company, 2004
Kodak and DryView are trademarks of Eastman Kodak Company.

Catalog number 1344720
Rev. A

Table of Contents

1 Safety and Related Information

Safety, Warnings, and Cautions 1-1
Safety Labels 1-4
Safety and Health Compliance 1-8
Safety 1-8
EMC 1-9
EU Directives 1-13
CE Marking 1-14
Conventions 1-14
Please Note 1-14

2 Overview

8900 Laser Imager 2-1
System Components 2-2
How the Laser Imager Works 2-4
Equipment Specifications 2-5
Size and Weight 2-5
Heat Output 2-6
Power 2-6
Power Consumption 2-6
Power Supply 2-6
Laser 2-6
Acoustic Noise 2-7
Floor Vibration 2-7
Warmup Time 2-7
Film Throughput 2-7
Film Drawers 2-7
Image Size and Orientation on Film 2-8
Site Specifications 2-10
Space Requirements 2-10
Floor Load 2-11
Floor Levelness 2-11
Seismic Kit Installation 2-12

Power Requirements 2-12
Network Drop 2-12
Network Address 2-12
Environment Requirements 2-13
Site Checklist 2-14
Pre-Installation Tasks 2-14

3 Preventive Maintenance

Necessary Materials 3-1
Tools 3-1
Materials 3-2
Maintenance Plan 3-3
Preventive Maintenance 3-3
Emergency Maintenance 3-4
Maintenance Procedures 3-5
Preparing for Preventive Maintenance 3-6
Cleaning the Carriage Rails 3-7
Cleaning the Encoder Scales 3-8
Cleaning the Film Platen 3-9
Cleaning the FAZ Traps and Drum Duct 3-10
Cleaning the Drum Cover 3-13
Installing New Cover Gaskets on the Drum Cover 3-14
Cleaning the Pressure Rollers and Applying Lubricant 3-15
Cleaning the Drum 3-17
Cleaning the Lower Cover and Entrance Guide 3-18
Cleaning the Diverter and Installing a New Felt Pad Assembly 3-19
Installing a New Diverter Assembly and Felt Pad Assembly 3-21
Installing New Drum Exit Transport Rollers 3-23
Cleaning the Cooling Section 3-25
Cleaning the FAZ Hoses 3-26
Assembling the Processor 3-27
Installing New Charcoal Filters 3-28
Cleaning the Charcoal Filter Housing, Upper Plenum, and Duct 3-29
Cleaning the Filtration Gaskets and Back Door Seals 3-31
Installing a New Air Filter 3-32
Checking the Operation 3-33
Resetting the Preventive Maintenance Count and Changing the Service History 3-33

4 Replacements

Imaging Assembly 4-1
Removing: 4-1
Installing: 4-2

Upper FAZ Trap 4-3
Removing: 4-3
Installing: 4-3
Lower FAZ Trap 4-4
Removing: 4-4
Installing: 4-4
Processor Drum 4-5
Removing: 4-5
Installing: 4-7

5 Troubleshooting

Status and Error Messages 5-1
Local Panel Status Messages 5-1
Local Panel Error Messages 5-3
Operator Actions 5-3
Clearing Film Jams 5-21
Film Drawers and Door Override Latches 5-22
Manually Closing the Film Cartridge Lid 5-23
Clearing Film Jams from Area 1 5-23
Clearing Film Jams from Area 2 5-24
Clearing Film Jams from Area 3 5-25
Clearing Film Jams from Area 4 5-26
Clearing Film Jams from Area 5 5-28
Clearing Film Jams from Area 6 5-29

6 Support Information

Calling for Support 6-1
Ordering Supplies 6-1

Appendix A: Quality Control Procedures

Compliance Guide - Quality Control for Laser Imagers Used in Digital Mammography Systems A-1
Automatic Image Quality Control and the QC Process A-1
Running a QC Baseline Test A-2
Procedure for the Installing Field Engineer A-2
Procedure for the QC Technologist A-2
Baseline Test A-2
Running a Daily QC Test A-5

Glossary

Index

1 Safety and Related Information

Safety, Warnings, and Cautions

Please read and understand all instructions before using this product.

RISK OF ELECTRIC SHOCK:
This equipment is operated with hazardous voltage which can shock, burn or cause death.

- Remove wall plug before servicing equipment. Never pull on cord to remove from outlet. Grasp plug and pull to disconnect. Only perform maintenance that is described in this Guide. Do not attempt to service or repair the laser imager yourself to avoid exposure to dangerous voltage, laser beam, or other danger. Always call an Authorized Service Provider of Kodak products for any service or repair.
- Do not operate equipment with a damaged power cord.
- Do not use an extension cord to power this equipment.
- Do not operate equipment with any of the safety interlocks overridden.
- Position the power cord so it will not be tripped over or pulled.
- Connect this equipment to a grounded wall outlet.

***WARNING*:**
This equipment contains moving parts that may be accessible to the user. Loose clothing, jewelry or long hair may cause personal injury or damage to the equipment.

- Do not operate equipment with the covers open.
- Do not operate equipment with any of the safety interlocks overridden.

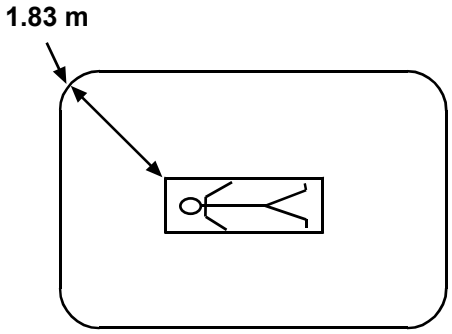
***WARNING*:**
This equipment is not contained in a sealed cabinet. Do not use this equipment in locations where it can come in contact with liquids, including body fluids.

CAUTION:
Do not use a cell phone within 2 meters of a laser imager. This proximity includes any imager behind a wall adjacent to your location.

CAUTION:
Do not use a microwave oven within 4 meters of a laser imager. Electromagnetic radiation from a microwave oven is only an issue if after the oven door is closed and latched, the seal does not maintain an electromagnetic tight fit between the oven door and oven main housing. Determining if the seal has an electromagnetic tight fit requires special detection equipment.

CAUTION:
Do not use in the presence of flammable anesthetics, oxygen, or nitrous oxide. This equipment does not have a gas-sealed electronics enclosure and could ignite any flammable or explosive gases present in its environment.

CAUTION:
This equipment is intended to connect to other medical devices. Only an Authorized Service Provider of Kodak products may perform installation and service maintenance. This device is NOT to be located within the patient environment. Therefore, the equipment must not be located closer than 1.83 meters from a patient bed or chair.



CAUTION:
This device should not be used in close contact with MRI devices, due to possible very high magnetic fields near an MRI unit.

CAUTION:
Do not substitute or modify any part of this equipment without prior written approval of Eastman Kodak Company.

CAUTION:
Federal law prohibits dispensing without a prescription.

CAUTION:
This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the Guide, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

CAUTION:
Do not use isopropyl alcohol to clean the exterior surfaces of the laser imager. Isopropyl alcohol can dissolve the exterior paint on the laser imager.

CAUTION:
Filters are considered to be non-hazardous waste according to the US Environmental Protection Agency Resource Conservation Recovery Act (RCRA). You may dispose of filters in a landfill or incinerator with energy recovery in a municipal, commercial or industrial facility. Contact your state or local government to determine if additional disposal requirements apply.

CAUTION:
Lithium batteries should only be replaced by an Authorized Service Provider of Kodak products. The laser imager uses a lithium battery to power the clock and calendar circuitry. THERE IS A DANGER OF EXPLOSION IF THE BATTERY IS REPLACED INCORRECTLY. The battery must be replaced only with the same or equivalent type recommended by Motorola Inc. The US EPA's RCRA does not regulate disposal of this lithium battery. Users should discard spent batteries in municipal trash unless their community offers a battery collection program.

CAUTION:

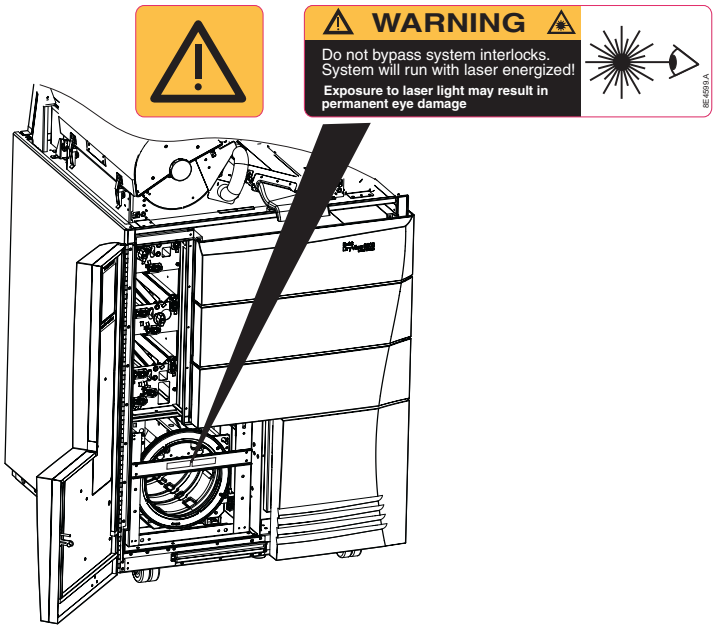
This product contains lead and mercury. The lead is located in the solder on the circuit boards. Mercury is located in the back light of the local panel. Disposal of components containing these materials may be regulated due to environmental considerations. For disposal or recycling information at the end of usable service, please contact your local authorities or visit the Electronics Industry Alliance Web site at: http://www.eiae.org.

LASER WARNING:

The equipment uses a 100-milliwatt invisible laser. Laser radiation may be present when the machine operates without the rear cover installed. Covers with this label may only be removed by an Authorized Service Provider of Kodak products. USE OF CONTROLS OR ADJUSTMENTS, OR PERFORMANCE OF PROCEDURES OTHER THAN THOSE SPECIFIED HEREIN, MAY RESULT IN EYE DAMAGE.

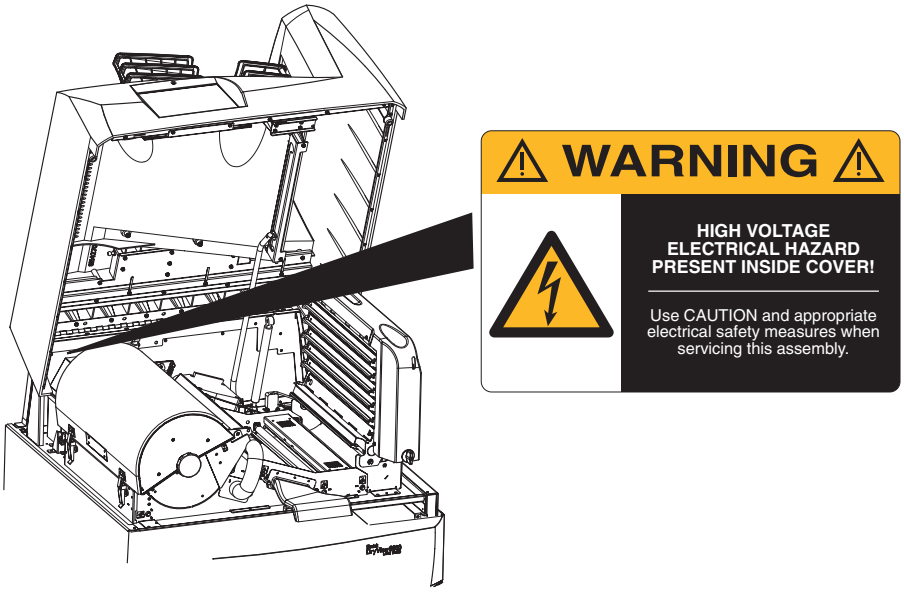
Safety Labels

Safety labels are attached to the laser imager in compliance with international standards.


WARNING
Do not bypass system interlocks.
System will run with laser energized!
Exposure to laser light may result in permanent eye damage

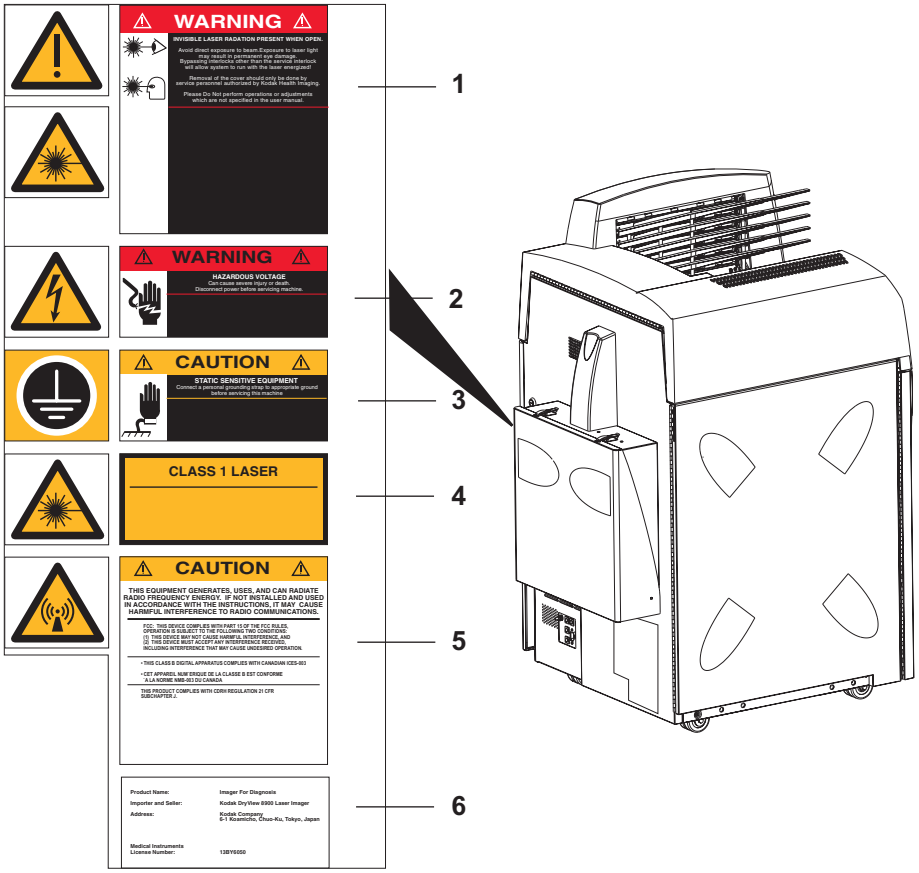
Laser Radiation Warning Labels

Laser Interlock. This warning label indicates that laser energy is present. Defeating interlocks allows the laser imager to run with the laser energized. AVOID DIRECT EXPOSURE TO THE LASER BEAM. EXPOSURE TO LASER ENERGY MAY RESULT IN PERMANENT EYE DAMAGE.



High Voltage Warning Label

This warning label indicates that high voltage is present under panels or enclosures where labels are attached. These panels may only be removed by an Authorized Service Provider of Kodak products.



Warning and Caution Labels

1 **Invisible Laser Radiation Present When Open.** This warning label indicates that invisible laser radiation is present under panels where labels are attached. These panels may only be removed by an Authorized Service Provider of Kodak products. AVOID DIRECT EXPOSURE TO THE LASER BEAM. EXPOSURE TO LASER ENERGY MAY RESULT IN PERMANENT EYE DAMAGE. DEFEATING INTERLOCKS ALLOWS THE LASER IMAGER TO RUN WITH THE LASER ENERGIZED.

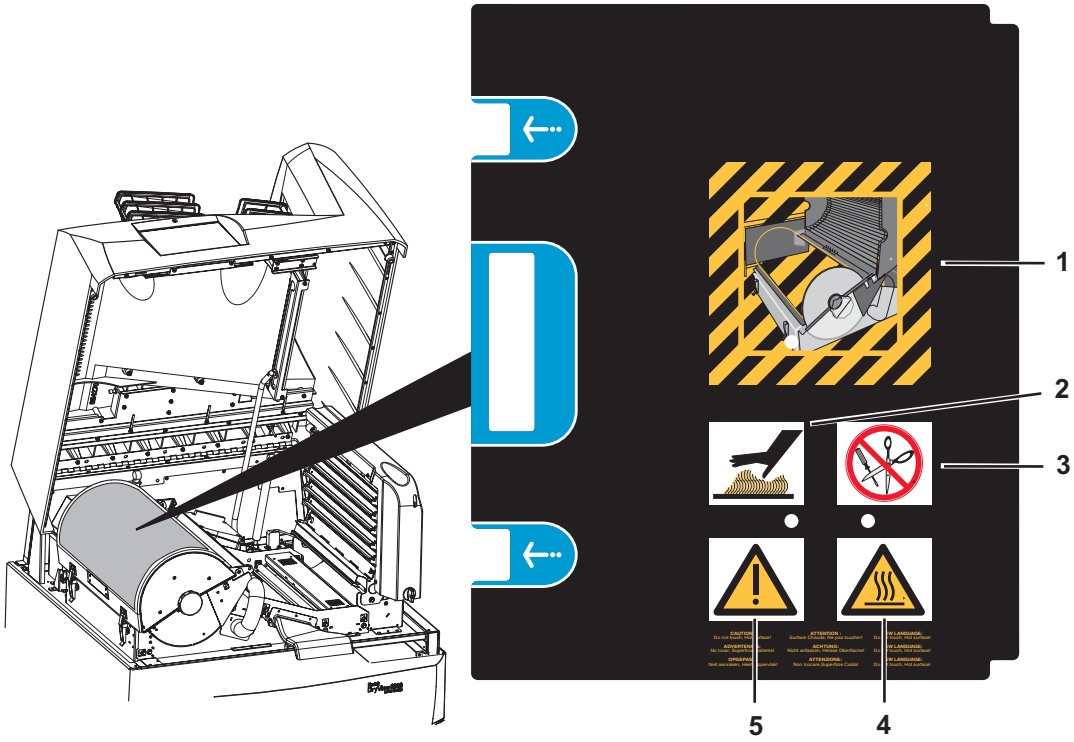
2 **Hazardous Voltage.** This warning label indicates that high voltage is present under panels where the label is attached. Only an Authorized Service Provider of Kodak products should attempt access.

3 **Static Sensitive Equipment.** This label identifies static-sensitive components. Connect a personal grounding strap to appropriate ground before servicing this laser imager. These panels may only be removed by an Authorized Service Provider of Kodak products.

4 **Class 1 Laser.** This label indicates that the laser imager complies with IEC requirements for Class 1 systems.

5 **Radio Frequency Energy.** This label indicates that the laser imager can radiate radio frequency energy. If not installed and used in accordance with the instructions, the laser imager may cause harmful interference to radio communications.

6 **Manufacturer Identification.** This label indicates the product name, manufacturer's name, importer's name, and license number.



Processor Drum Cover Label

1 **Processor drum cover pictogram.** This pictogram illustrates the processor drum cover open. When open, take caution to avoid heat and use of sharp objects.

2 **Caution - hot surface pictogram.** This pictogram advises to use care near the processor drum to avoid possible burns.

3 **Caution - no sharp objects pictogram.** This pictogram advises to avoid using sharp objects near the processor drum.

4 **ISO label.** This warning label advises to use care near the processor drum to avoid possible burns.

5 **ISO label.** This label identifies a possible warning or caution and indicates applicable information in the User Guide.

Safety and Health Compliance

This equipment has been tested for and complies with the following Safety and Emissions Standards. Certificates of Compliance and Declarations of Conformity have been issued as shown below.

Safety

United States

21 CFR 900.12(e) Mammography Quality Standards Act; Quality Standards; Quality Assurance for Equipment.

21 CFR 1040.10 Class I

Code of Federal Regulations Title 21 Food and Drugs

Chapter I Food and Drug Administration, Department of Health and Human Services

Volume 8 - Parts 800 to 1299

Subchapter J - Radiology Health

Part 1040 - Performance Standards for Light Emitting Products

Section 10 - Laser Products

FDA 21CFR 807 Premarket Notification 510(K): Regulatory Requirements For Medical Devices.

UL 60950-1: Safety of Information Technology Equipment, including Electrical Business Equipment (Bi-National Standard).

IEC 60601-1-1: Medical electrical equipment - Part 1: General requirements for safety - Section 1: Collateral standard: Safety requirements for medical electrical systems, Clause 19.

IEC 60825-1: Safety of laser products - Part 1 : Equipment classification, requirements and user's guide.

Canada

CAN/CSA - C22.2 NO 60950-1-03 Information Technology Equipment - Safety - Part 1: General Requirements. (Bi-National Standard, with UL 60950-1).

IEC 60601-1-1: Medical electrical equipment - Part 1: General requirements for safety - Section 1: Collateral standard: Safety requirements for medical electrical systems, Clause 19.

IEC 60825-1: Safety of laser products - Part 1: Equipment classification, requirements and user's guide.

Europe

EN60950-1: Safety of Information Technology Equipment, including Electrical Business Equipment (IEC 60950: 1991, Modified) (Includes Amendment A1, A2, A3, A4, and A11).

EN60601-1-1: Medical electrical equipment - Part 1: General requirements for safety - Section 1: Collateral standard: Safety requirements for medical electrical systems, Clause 19.

EN60825-1: Safety of laser products - Part 1: Equipment classification, requirements and user's guide.

Rest of World

IEC 60950-1: Safety of information technology equipment.

IEC 60601-1-1: Medical electrical equipment - Part 1: General requirements for safety - Section 1: Collateral standard: Safety requirements for medical electrical systems.

IEC 60825-1: Safety of laser products - Part 1: Equipment classification, requirements and user's guide.

EMC

United States

FCC Rules and Regulations, Title 47, Part 15, Subpart B, Class A: Radio Frequency Devices: Unintentional Radiators.

This equipment has been tested and been found to comply with the limits for a Class A digital device pursuant to part 15 of the FCC rules. Those limits are designed to provide reasonable protection against harmful interference in a residential installation.

FCC Rules and Regulations, Title 47, Part 15, Subpart C, Radio Frequency Devices: Intentional Radiators. "FCC ID: PA 48E1587"

Canada

CAN/CSA-C108.6-M91, Class A: Limits and Methods of Measurement of Electromagnetic Disturbance Characteristics of Industrial, Scientific and Medical (ISM) Radio-Frequency Equipment.

Intentional Radiation "IC: 1016B8E1587"

This Class A digital apparatus complies with Canadian ICES-003.

CET APPAREIL NUM ENRIQUE DE CLASSE A EST CONFORME A LA NORME NMB-003 DU CANADA.

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Europe and the Rest of World

Guidance and Manufacturer's Declaration for Electromagnetic Emissions		
The *Kodak DryView* 8900 Laser Imager is intended for use in the electromagnetic environment specified below. The customer or user of the *Kodak DryView* 8900 Laser Imager should assure that it is used in such an environment.		
Emissions Test	**Compliance**	**Electromagnetic Environment - Guidance**
RF emissions: • EN55011 • CISPR 11	Group 1	The *Kodak DryView* 8900 Laser Imager uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF emissions: • EN55011 • CISPR 11	Class A	The *Kodak DryView* 8900 Laser Imager is suitable for use in all establishments other than domestic and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Harmonic emissions: • EN61000-3-2 • IEC 61000-3-2	Class A	The *Kodak DryView* 8900 Laser Imager is suitable for use everywhere, including those establishments directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Voltage fluctuations and flicker emissions: • EN61000-3-3 • IEC 61000-3-3	Complies	The *Kodak DryView* 8900 Laser Imager is suitable for use everywhere, including those establishments directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.

Guidance and Manufacturer's Declaration for Electromagnetic Immunity			
The *Kodak DryView* 8900 Laser Imager is intended for use in the electromagnetic environment specified below. The customer or user of *the l*aser imager should assure that it is used in such an environment.			
Immunity Test	**IEC 60601 Test Level**	**Compliance Level**	**Electromagnetic Environment - Guidance**
Electrostatic discharge (ESD): • EN61000-4-2 • IEC 61000-4-2	± 6 kV contact ± 8 kV air	± 6 kV contact ± 8 kV air	Floors should be wood, concrete, or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.
Electrical fast transient/burst: • EN61000-4-4 • IEC 61000-4-4	± 2 kV for power supply lines ± 1 kV for input/output lines	± 2 kV for power supply lines ± 1 kV for input/output lines	Mains power quality should be that of a typical commercial or hospital environment.
Surge: • EN61000-4-5 • IEC 61000-4-5	± 1 kV differential mode ± 2 kV common mode	± 1 kV differential mode ± 2 kV common mode	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply lines: • EN61000-4-11 • IEC 61000-4-11	<5% Uτ* (>95% dip in Ut*) for 0.5 cycle 40% Uτ* (60% dip in Uτ*) for 5 cycles 70% Uτ* (30% dip in Uτ*) for 25 cycles <5% Uτ* (>95% dip in Uτ*) for 5 sec.	<5% Uτ* (>95% dip in Uτ*) for 0.5 cycle 40% Uτ* (60% dip in Uτ*) for 5 cycles 70% Uτ* (30% dip in Uτ*) for 25 cycles <5% Uτ* (>95% dip in Uτ*) for 5 sec.	Mains power quality should be that of a typical commercial or hospital environment. If the user of the *Kodak DryView* 8900 Laser Imager requires continued operation during power mains interruptions, it is recommended that the *Kodak DryView* 8900 Laser Imager be powered from an uninterruptible power supply or a battery.
Power frequency (50/60 Hz) magnetic field: • EN61000-4-8 • IEC 61000-4-8	3 A/m	3 A/m	Mains power quality should be that of a typical commercial or hospital environment.
NOTE: * Uτ is the a.c. mains voltage prior to application of the test level.			

Guidance and Manufacturer's Declaration for Electromagnetic Immunity			
The *Kodak DryView 8900* Laser Imager is intended for use in the electromagnetic environment specified below. The customer or user of the *Kodak DryView* 8900 Laser Imager should assure that it is used in such an environment.			
Immunity Test	IEC 60601 Test Level	**Compliance Level**	**Electromagnetic Environment - Guidance**
			Portable and mobile RF communications equipment should be used no closer to any part of the *Kodak DryView* 8900 Laser Imager, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. **Recommended Separation Distance:**
Conducted RF IEC 61000-4-6	3 Vrms 150 kHz to 80 MHz	3 Vrms	$d = 1.17\sqrt{P}$
Radiated RF IEC 61000-4-3	3 v/m 80 MHz to 2.5 GHz	3 v/m	$d = 1.17\sqrt{P}$ 80 MHz to 800 MHz $d = 2.33\sqrt{P}$ 800 MHz to 2.5 GHz *d* is the recommended separation distance in meters (m). *P* is the maximum output rating of the transmitter in watts (W) according to the transmitter manufacturer. Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey "a", should be less than the compliance level in each frequency range "b". Interference may occur in the vicinity of equipment marked with the following symbol:
NOTE: • At 80 MHz and 800 MHz, the higher frequency range applies. • These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people. a See Note 1 on next page. b See Note 2 on next page.			

Guidance and Manufacturer's Declaration for Electromagnetic Immunity	
Note 1	Field strengths from fixed transmitters, such as base station for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the *Kodak DryView* 8900 Laser Imager is used exceeds the applicable RF compliance level above, the *Kodak DryView* 8900 Laser Imager should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the *Kodak DryView* 8900 Laser Imager.
Note 2	Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 v/m.

Recommended separation distance between portable and mobile RF communications equipment and the Kodak DryView 8900 Laser Imager

The *Kodak DryView* 8900 Laser Imager is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the *Kodak DryView* 8900 Laser Imager can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communication equipment (transmitters) and the *Kodak DryView* 8900 Laser Imager as recommended below, according to the maximum output of the communications equipment.

Rated maximum output power of transmitter (*P*) in Watts (W)	**Separation distance (*d*) according to frequency of transmitter in meters (m)**		
	150 kHz to 80 MHz $d = 1.17\sqrt{P}$	80 MHz to 800 MHz $d = 1.17\sqrt{P}$	800 MHz to 2.5 GHz $d = 2.33\sqrt{P}$
0.01			
0.1			
1			
10			
100			

For transmitters rated at a maximum output power not listed above, the recommended separation distance *d* in meters (m) can be estimated using the equation applicable to the frequency of the transmitter, where *P* is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.

NOTE 1: At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies.

NOTE 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

EU Directives

93/42/EEC Title: Council Directive Concerning Medical Devices.

99/05/EEC Title: Council Directive Concerning Radio and Telecommunications Terminal Equipment.

73/23/EEC Title: Council Directive on the Harmonization of the Laws of Member States Relating to Electrical Equipment Designed for Use within Certain Voltage Limits.

89/336/EEC Title: Council Directive on the Approximation of the Laws of the Member States Relating to Electromagnetic Compatibility.

CE Marking

Documents concerning the conformance of this product to Council Directive 93/42/EEC of 14 June 1993 concerning Medical Devices can be obtained from the Eastman Kodak Company, Health Imaging Group European Representative at:

Kodak GmbH

Product Safety

70323 Stuttgart

Germany

Phone: ++49 711 406 2993

Fax: ++49 711 406 3513

Conventions

The following special messages emphasize information or indicate potential risks to personnel or equipment.

NOTE: Notes provide additional information, such as expanded explanations, hints, or reminders.

IMPORTANT: *Important notes highlight critical policy information that affects how you use this guide and this product.*

CAUTION:

Cautions point out procedures that you must follow precisely to avoid damage to the system or any of its components, loss of data, or corruption of files in software applications.

***WARNING*:**

Warnings identify procedures that you must follow precisely to avoid injury to yourself or others.

LASER WARNING:

Laser warnings warn personnel that access to laser radiation is possible and all personnel must avoid direct exposure to the beam.

Please Note

The information contained herein is based on the experience and knowledge relating to the subject matter gained by Eastman Kodak Company prior to publication. No patent license is granted by this information. Eastman Kodak

Company reserves the right to change this information without notice and makes no warranty, express or implied, with respect to this information. Kodak shall not be liable for any loss or damage, including consequential or special damages, resulting from the use of this information, even if loss or damage is caused by Kodak's negligence or other fault.

2 Overview

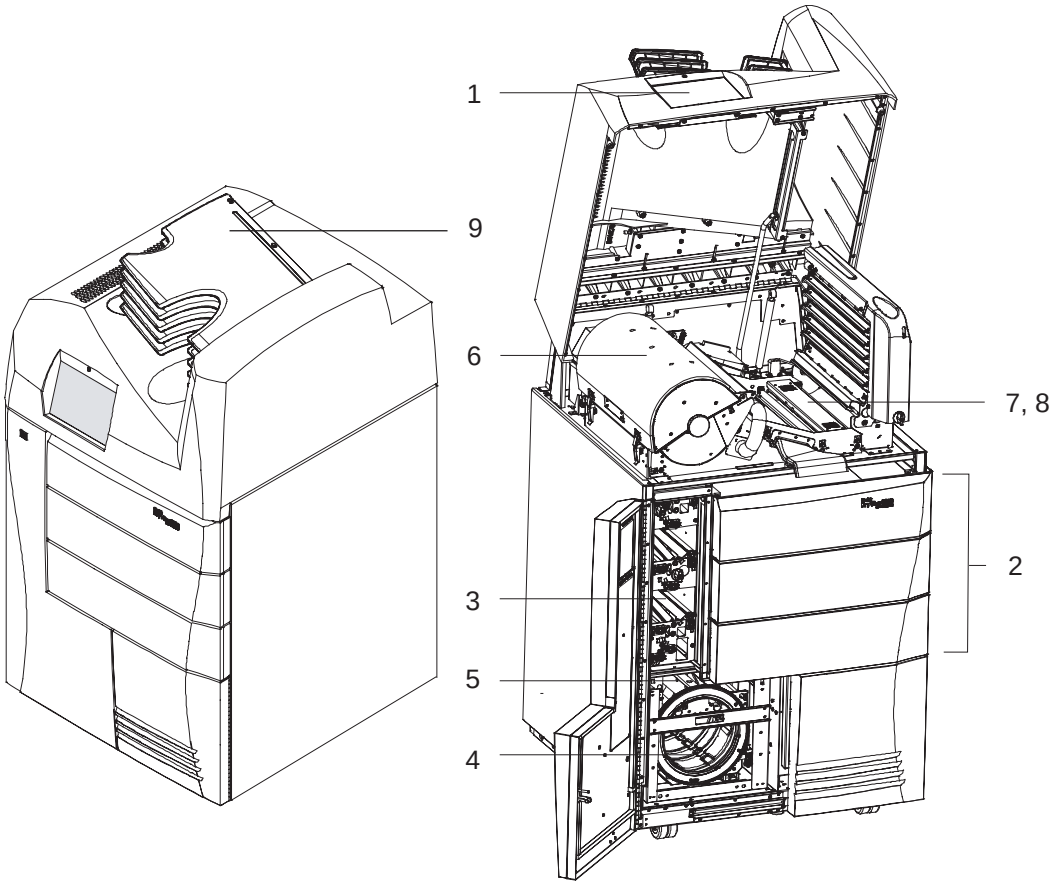
8900 Laser Imager

The *Kodak DryView* 8900 Laser Imager is a continuous-tone laser imager with an internal photothermographic film processor. Heat, rather than photo chemicals, is used to develop the film. The laser imager receives the digital image data through a DICOM medical imaging protocol.

The laser imager prints images on *Kodak DryView* Laser Imaging Film which is packed in 125-sheet cartridges. You can load three cartridges into the laser imager simultaneously. The laser imager can accept blue or clear base film in any of the following sizes:

Size (Metric)	Size (US)	Film
20 x 25 cm	8 x 10 in.	*DryView* Laser Imaging Film
20 x 25 cm	8 x 10 in.	*DryView* Mammography Laser Imaging Film
25 x 30 cm	10 x 12 in.	*DryView* Laser Imaging Film
25 x 30 cm	10 x 12 in.	*DryView* Mammography Laser Imaging Film
28 x 35 cm	11 x 14 in.	*DryView* Laser Imaging Film
35 x 35 cm	14 x 14 in.	*DryView* Laser Imaging Film
35 x 43 cm	14 x 17 in.	*DryView* Laser Imaging Film

System Components



System Components

1 **Touch screen local panel**. The local panel is your interface to the laser imager. The panel accepts your commands and gives you status information about the laser imager functions.

2 **Film drawers.** Your laser imager may be configured for one, two, or three film drawers. Each film drawer can hold any of five different sizes of *Kodak DryView* Laser Imaging Film. You can select the film cartridge in any film drawer for printing.

3 **Film transport**. The film transport moves the film through the laser imager.

4 **Film platen**. The film platen positions the film and holds the film stationary for imaging.

5 **Optics module**. The optics module writes (exposes) the image onto the film while the film is positioned on the film platen.

6 **Film processor**. The film processor uses heat to develop the image exposed onto the film by the laser in the optics module.

7 **Densitometer**. The densitometer receives the film and performs a density check to confirm image quality. The densitometer is the key component of the Automatic Image Quality Control (AIQC) system.

8 **AIQC**. The AIQC system ensures that contrast, density, and other image-quality parameters meet preset user preferences.

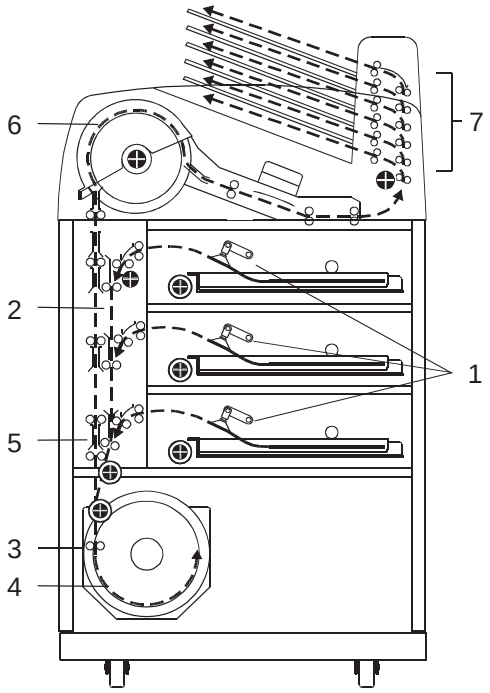
9 **Film sorter**. Your laser imager may be configured without a film sorter. The film sorter receives the processed film after the film passes through the densitometer and transports the film to the selected film bin on top of the laser imager. The bottom bin holds 125 sheets of film. Each of the top five bins holds 30 sheets of film.

How the Laser Imager Works

When the laser imager receives a print request and image data from the modality (image capturing device), the system determines the requested film size from the information included with the image data. The system then selects the appropriate film cartridge.

Each time a modality sends the laser imager a print request, the following print sequence occurs.

1. Suction cups in the pickup area lift a single sheet of film out of the supply cartridge and feed the film into the vertical transport rollers.
2. The vertical transport rollers move the film down to the film platen (exposure area).
3. The platen rollers move the film into the film platen.
4. The film platen holds the film while the scanner writes the image onto the film.
5. The platen rollers move the film into the vertical transport rollers, which move the film into the film processor.
6. As the film passes over the processor drum, the heat generated by the drum develops the film.
7. If the laser imager is configured with a film sorter, the film transport rollers move the exposed film through the densitometer to the film sorter and out to one of the six bins. If no film sorter is present, the film will be placed on the top hood.



Print Sequence

Equipment Specifications

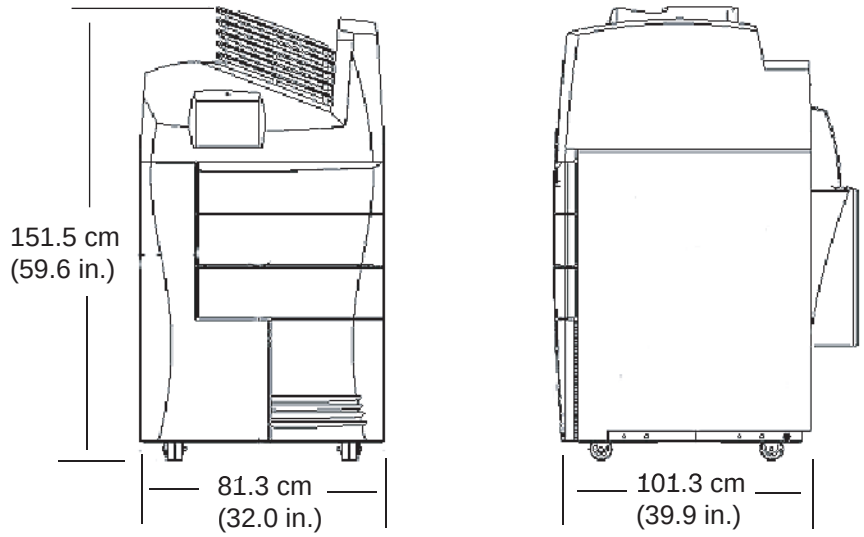
Size and Weight

Packed:

- Height: 176.53 cm (69.5 in.)
- Width: 101.60 cm (40 in.)
- Depth: 142.24 cm (56 in.)
- Weight: 544.31 kg (1200 lb)

NOTE: Packed dimensions include the pallet as part of the shipping package.

Unpacked:



- Height: 151.5 cm (59.6 in.)
- Width: 81.3 cm (32.0 in.)
- Depth: 101.3 cm (39.9 in.)
- Weight: 466 kg (1028 lb)

Heat Output

The laser imager dissipates not more than 3,000 BTU/hour under all operating conditions.

Power

V AC (50/60 Hz + 3 Hz)	Maximum Current
100 V AC + 10%	15 A
120 V AC + 10%	12 A
200 V AC + 10%	7 A
220 V AC + 10%	7 A
240 V AC + 10%	7 A

Power Consumption

1530 W maximum

Power Supply

The laser imager uses a single power supply worldwide. At installation a line-match plug, selected to match the input source voltage, is inserted into the power supply at the input to the power transformer. The output of the power transformer supplies the 120 and 240 V AC required by the laser imager. A kit of five line-match plugs is provided:

V AC	Range	Plug
100 V AC nominal source input	80 - 105 V AC	Brown wires
120 V AC nominal source input	106 - 130 V AC	Red wires
200 V AC nominal source input	180 - 210 V AC	Orange wires
220 V AC nominal source input	211 - 230 V AC	Yellow wires
240 V AC nominal source input	231 - 250 V AC	Blue wires

Laser

- Maximum power: 100 mW
- Wavelength: 810 nanometers
- Type: diode
- Radiation class: 3b

NOTE: As configured in the laser imager, the laser is a Class 1 device.

Acoustic Noise

- Average noise at 1 meter during operation: maximum of 55 dB-A
- Momentary noise (1 second) during operation: maximum of 70 dB-A
- Noise caused by non-repetitive tasks such as opening/closing doors or a film cartridge: maximum of 80 dB-A

Floor Vibration

The laser imager operates with no image quality degradation while experiencing floor vibration levels of up to:

- 1×10^{-7} G^2/Hz at a frequency range of 1-50 Hz in the vertical or horizontal direction.
- 6×10^{-5} G^2/Hz at a frequency range of 50-200 Hz in the vertical or horizontal direction.
- 5×10^{-6} G^2/Hz at a frequency range of 200-650 Hz in the vertical or horizontal direction.
- 1×10^{-6} G^2/Hz at a frequency range of 50-1000 Hz in the vertical or horizontal direction.

Warmup Time

With an ambient temperature of 20°C (68°F), the laser imager achieves ready-to-print status in 45 minutes or less after application of power. This assumes the machine is line-matched properly for 120, 200, or 240 V AC source voltages. For sites with source voltages less than 120 V AC that do not provide a 20 A service, warmup time may be longer than 45 minutes.

Film Throughput

Prints up to 200 films per hour.

Film Drawers

The laser imager can include up to three film supply drawers, each of which can hold any of the film types and sizes specified below.

Image Size and Orientation on Film

The laser imager has the capability of printing from edge to edge for jobs that include Requested Image Size. The table below shows, for both portrait and landscape orientation, the maximum image sizes that can be printed on the five film sizes. The table defines the maximum number of pixels that can be accepted with or without annotations printed on the film.

If annotations are printed, some pixel space will be used for the text, and consequently the maximum image size will be reduced. If minification or crop is used, larger images may be printed, but some image data will be discarded to allow the image to fit onto the page. When this occurs, an icon is printed on the bottom of the page to indicate that minification or crop has occurred.

Mode	Film Sizes	Maximum Width		Maximum Height without Annotation	Maximum Height with Annotation
With requested image size (portrait)	8 in. x 10 in.	5167 pixels	201.91 mm	6490 pixels	6234 pixels
	10 in. x 12 in.	6490 pixels	253.60 mm	7767 pixels	7511 pixels
	11 in. x 14 in.	7137 pixels	278.89 mm	9100 pixels	8844 pixels
	35 cm x 35 cm	9100 pixels	355.60 mm	9087 pixels	8831 pixels
	35 cm x 43 cm	9100 pixels	355.60 mm	11037 pixels	10781 pixels
Without requested image size (portrait)	8 in. x 10 in.	5167 pixels	Not applicable	6286 pixels	6030 pixels
	10 in. x 12 in.	6490 pixels	Not applicable	7342 pixels	7086 pixels
	11 in. x 14 in.	7137 pixels	Not applicable	8896 pixels	8640 pixels
	35 cm x 35 cm	9100 pixels	Not applicable	8662 pixels	8406 pixels
	35 cm x 43 cm	9100 pixels	Not applicable	10612 pixels	10356 pixels
With requested image size (landscape)	8 in. x 10 in.	6490 pixels	253.60 mm	5167 pixels	4911 pixels
	10 in. x 12 in.	7767 pixels	303.51 mm	6490 pixels	6234 pixels
	11 in. x 14 in.	9100 pixels	355.59 mm	7137 pixels	6881 pixels
	35 cm x 35 cm	9087 pixels	355.09 mm	9100 pixels	8844 pixels
	35 cm x 43 cm	11037 pixels	431.28 mm	9100 pixels	8844 pixels
Without requested image size (landscape)	8 in. x 10 in.	6280 pixels	Not applicable	4742 pixels	4486 pixels
	10 in. x 12 in.	7342 pixels	Not applicable	6286 pixels	6030 pixels
	11 in. x 14 in.	8896 pixels	Not applicable	6712 pixels	6456 pixels
	35 cm x 35 cm	8662 pixels	Not applicable	8896 pixels	8640 pixels
	35 cm x 43 cm	10612 pixels	Not applicable	8896 pixels	8640 pixels
* Pixel pitch = 25.591					

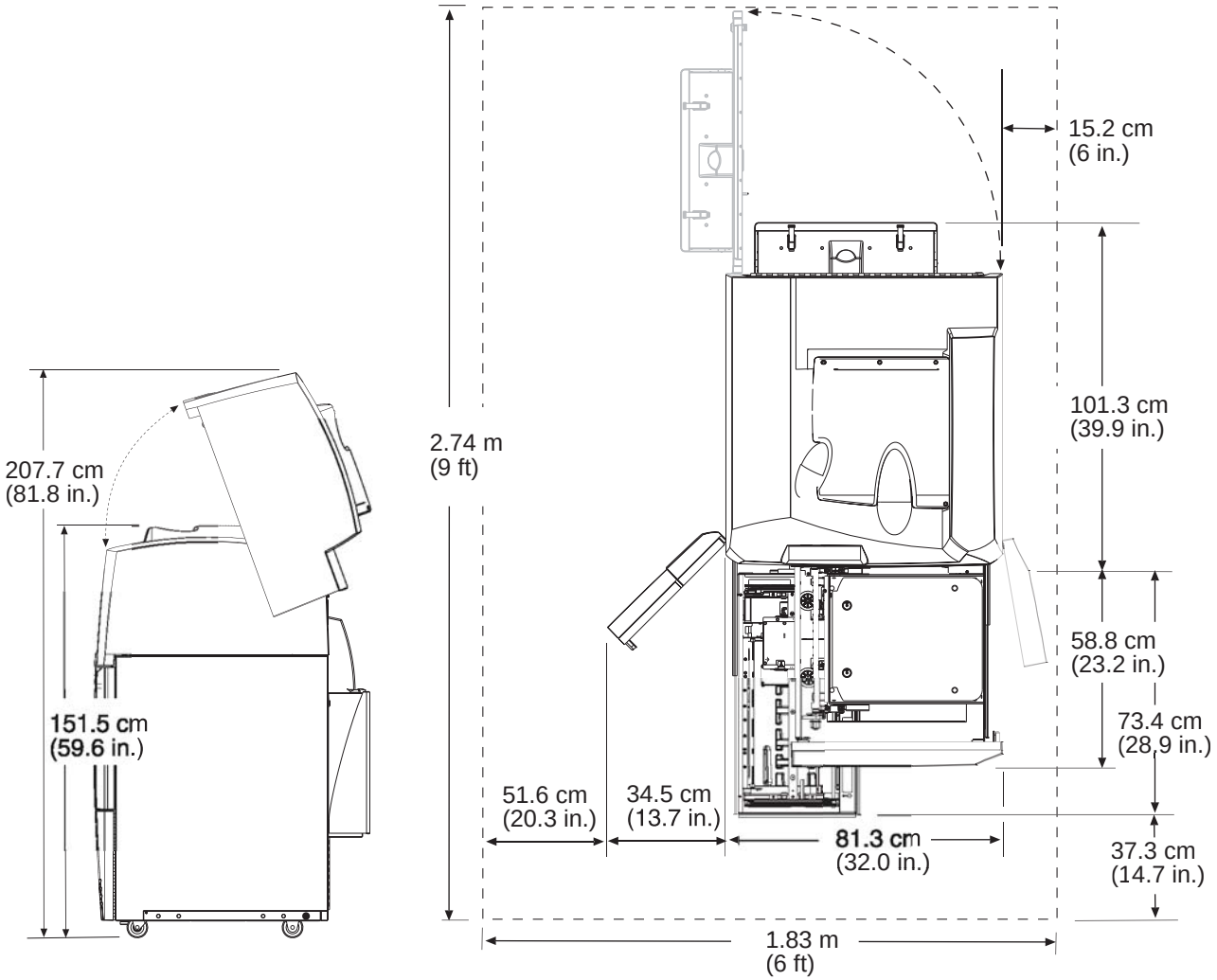
The tables above specify maximum image dimensions for a 1-up image, assuming that the Requested Decimate/Crop attribute has been set to FAIL. For multi-page formats, the maximum image dimensions are determined by the following rules:

- In any Row on the film, the sum of all Image Widths plus all horizontal separations cannot exceed the Maximum Width values shown in the table above.
- In any Column, the sum of all Image Lengths plus all vertical separations cannot exceed the Maximum Height values shown in the table above.

Site Specifications

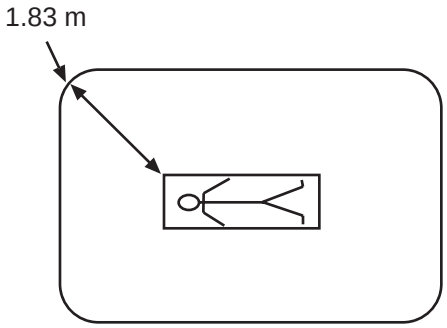
Space Requirements

IMPORTANT: *The dimensions in the illustration below show the space required for service functions if all doors and drawers are opened simultaneously. (This will seldom be necessary.) The laser imager has castors that allow the laser imager to be moved when service is performed. The machine stop at the front center base of the laser imager must be unscrewed before the laser imager can be moved. The machine stop must be screwed down handtight after the laser imager is placed in its operating location.*



Side and Top View - Hood, Doors, and Drawers Opened

CAUTION:
This device is not to be located within the patient environment. The equipment must not be located closer than 1.83 m from a patient bed or chair.



Floor Load

The laser imager weighs 466 kg (1028 lb). The laser imager sits on four castors positioned near the four corners of the laser imager. The center of gravity is near the center of the laser imager. Each castor, on the average, bears 1/4 of the weight: 116 kg (257 lb).

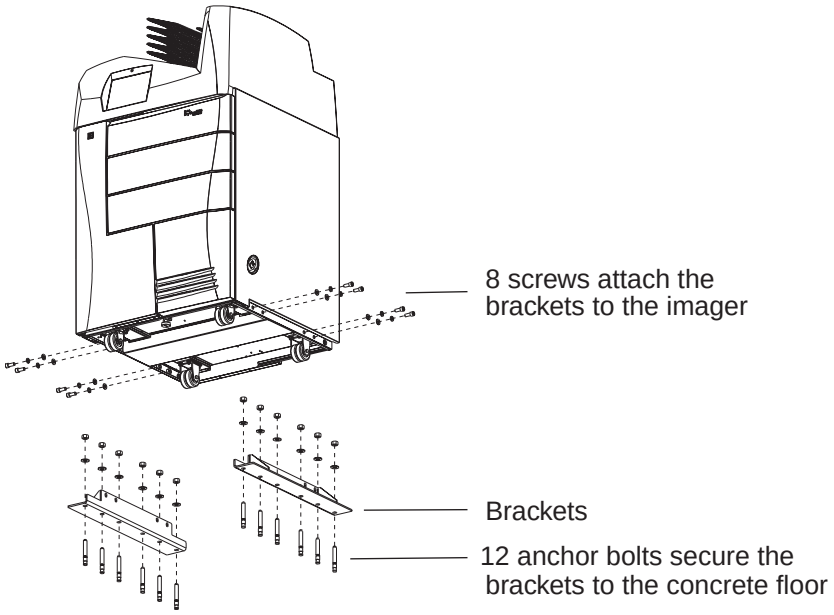
The laser imager floor load is 1465 kg/m^2 (300 lb/ft^2).

Floor Levelness

The floor under the laser imager must be less than 1 degree off level.

Seismic Kit Installation

Some installation sites require that the laser imager be fastened to a concrete floor to prevent movement due to an earthquake or MR attraction. The steel brackets and hardware used to bolt the laser imager to the concrete floor are supplied in a Seismic Kit. The brackets are attached to the sides of the laser imager (about 30 1/4 in. apart) and secured to anchor bolts in the concrete floor.



Power Requirements

The customer must provide power at an outlet located within 2.4 m (8 ft) of the back lower left corner of the laser imager. Power wires must have an insulation rating of 600 V. The outlet must provide access to one of the following power sources:

- 100 V AC +10%, 50/60 Hz + 3 Hz. Current draw will be a maximum of 15 A.
- 120 V AC +10%, 60 Hz + 3 Hz. Current draw will be a maximum of 12 A.
- 230 V AC +10%, 50 Hz + 3 Hz. Current draw will be a maximum of 7 A.

A dedicated line is recommended.

Network Drop

The customer must provide a single modular RJ-45 connector within 2.1 m (7 ft) of the back lower left corner of the laser imager.

Network Address

One IP address is required for the laser imager.

Environment Requirements

Heat Dissipation by Laser Imager

Maximum of 3,000 BTU/hour

Operating Environment

- Temperature: 15 to 35°C (59° to 95°F)
- Humidity: 20% to 75% RH, non-condensing
- Altitude: -30.48 to 2438.4 m (-100 to 8,000 ft)
- Noise Emission: average noise at 1 m (3.3 ft) during operation is 55 dBA
- Magnetic field: <50 Gauss
- Air flow: 0.5 cubic ft per minute (cfm) of fresh outside air per square foot (ft^2) of floor area (0.5 cfm/ft^2), assuming a maximum occupancy of 10 persons/1000 ft^2 in the room where the laser imager is located.

Storage Environment

- Temperature: -35 - 60°C (-31° to 140°F)
- Humidity: 10 - 90% RH, non-condensing

Site Checklist

Pre-Installation Tasks

Task	Responsibility	Description	Notes:
Space/Location	Customer	• A maximum space of 1.83 x 2.74 m (6 x 9 ft) is required to service the laser imager when all doors and drawers are open, and the imaging assembly is extended. During normal operation a much smaller space is sufficient. • When the laser imager is moved, doors must allow passage for a laser imager width of 81 cm (32 in.). • Floor under the laser imager must support a total laser imager weight of 466 kg (1028 lb) on 4 castors close to the machine base corners. Floor load is 1465 kg/m^2 (300 lb/ft^2). • If an elevator is to be used to transport the laser imager, the elevator must be able to accept the laser imager weight and width described above. • The floor under the laser imager must be less than 1 degree off level. • The laser imager cannot be located in the patient environment closer than 1.83 m (6 ft) from a patient bed or chair. • Some sites require a Seismic Kit, which an Authorized Service Provider of Kodak Products will install.	See "Space Requirements" on page 2-10 See "Floor Load" on page 2-11 See "Seismic Kit Installation" on page 2-12

Task	Responsibility	Description	Notes:
Power	Customer	The customer must provide AC power at an outlet within 2.4 m (8 ft) of the left rear lower corner of the laser imager. A dedicated power line is recommended.	See "Power Requirements" on page 2-12
Network connections	Customer	• The customer must provide a single modular RJ-45 connector within 2.1 m (7 ft) of the left rear lower corner of the laser imager. • The customer must supply an IP address and subnet mask for the laser imager. • The customer must determine that its modalities are qualified for connection to the laser imager.	
Film availability and storage	Customer	The customer must order the type of film to be used in the laser imager so that the film will be on site for installation. The customer must also provide a cool, dry, well-ventilated area for film storage.	
Air conditioning /ventilation	Customer	The customer must install or modify air conditioning and ventilation systems to ensure proper operation of the equipment.	See "Environment Requirements" on page 2-13
Installation	Authorized Service Provider of Kodak products	Installation strategy for the laser imager will vary by country.	Please contact your Kodak Sales Representative for details.
Modality Qualification	Customer and Kodak	The modalities that will send images over the network to the laser imager must be qualified to work with the laser imager.	

3 Preventive Maintenance

ESD WARNING:
This equipment includes parts and assemblies sensitive to damage from electrostatic discharge. Use caution to prevent damage during all service procedures.

Necessary Materials

Tools

Tool Number	Description
---	*Torx* screw driver set
TL4071	Vacuum cleaner
---	Flashlight
---	Scraper

Materials

Part Number	Description	Notes
SP96000001188	*3M* Auto-Pak tack cloth	
1C8287	Alcohol wipes	*Texwipe* TX1065 - 50 each
SP8643074	DMSO cleaner	6-oz container
SP78801828027	Cleaning pads, 10 x 10 cm (4 x 4 in.)	100 each
SP26101211303	*Krytox* lubricant	
SP78999828680	Bag with tie wrap	Use 1 bag for each preventive maintenance
SP1001064	Charcoal filters	Includes 2
SP8E1663	Air filter	
SP8E4708	Duct gasket	
SP8E4736	Cover gasket	Includes 2
SP8E1501	Diverter assembly	
SP8E1925	Felt pad assembly	
SP8E1183	Drum exit transport roller - drive	Install every 100,000 cycles
SP5E7997	Drum exit transport roller - idler	Install every 100,000 cycles
TL5713	Neoprene gloves	Use 1 time, then discard
952793	Safety glasses with side shields	
---	Lint-free cloth	

Maintenance Plan

Preventive Maintenance

IMPORTANT: *A preventive maintenance call must be made every 20,000 film cycles.*

- 20,000 cycle procedures are completed every preventive maintenance call.
- 40,000 cycle procedures are completed every other preventive maintenance call.
- 100,000 cycle procedures are completed every 5 preventive maintenance calls.

Procedure	20,000 Cycles	40,000 Cycles	100,00 Cycles
"Preparing for Preventive Maintenance" on page 3-6	X	X	X
Imaging Assembly			
"Cleaning the Carriage Rails" on page 3-7	X	X	X
"Cleaning the Encoder Scales" on page 3-8	X	X	X
"Cleaning the Film Platen" on page 3-9	X	X	X
Film Processor			
"Cleaning the FAZ Traps and Drum Duct" on page 3-10	X	X	X
"Cleaning the Drum Cover" on page 3-13	X	X	X
"Installing New Cover Gaskets on the Drum Cover" on page 3-14	X	X	X
"Cleaning the Pressure Rollers and Applying Lubricant" on page 3-15	X	X	X
"Cleaning the Drum" on page 3-17	X	X	X
"Cleaning the Lower Cover and Entrance Guide" on page 3-18	X	X	X
"Cleaning the Diverter and Installing a New Felt Pad Assembly" on page 3-19	X		X
"Installing a New Diverter Assembly and Felt Pad Assembly" on page 3-21		X	
"Installing New Drum Exit Transport Rollers" on page 3-23			X
"Cleaning the Cooling Section" on page 3-25	X	X	X
"Cleaning the FAZ Hoses" on page 3-26	X	X	X
"Assembling the Processor" on page 3-27	X	X	X

Procedure	20,000 Cycles	40,000 Cycles	100,00 Cycles
Filters			
"Installing New Charcoal Filters" on page 3-28	X	X	X
"Cleaning the Charcoal Filter Housing, Upper Plenum, and Duct" on page 3-29	X	X	
"Cleaning the Filtration Gaskets and Back Door Seals" on page 3-31		X	
"Installing a New Air Filter" on page 3-32		X	
Other Procedures			
"Checking the Operation" on page 3-33	X	X	X
"Resetting the Preventive Maintenance Count and Changing the Service History" on page 3-33	X	X	X

Emergency Maintenance

IMPORTANT: *The number of film cycles determines when you do emergency maintenance.*

On an emergency maintenance call, check the number of film cycles.

Film Cycles	Do:
>17,500	Preventive maintenance procedures
<17,500	Emergency maintenance procedures

Procedure
"Preparing for Preventive Maintenance" on page 3-6
"Cleaning the Pressure Rollers and Applying Lubricant" on page 3-15
"Cleaning the Drum" on page 3-17
"Checking the Operation" on page 3-33
"Resetting the Preventive Maintenance Count and Changing the Service History" on page 3-33

Maintenance Procedures

***WARNING*:**
Read the following warnings before doing maintenance procedures with DMSO cleaner:

- You must read the Material Safety Data Sheets (MSDS) for all cleaning materials before doing this procedure.
- You must wear neoprene gloves to prevent exposure to DMSO cleaner. The DMSO cleaner is readily absorbed through the skin, resulting in an almost instantaneous garlic-like taste in the mouth and bad breath that might persist for several days. There are no health issues for exposure to DMSO, but DMSO has the potential to carry other chemicals through the skin.
- You must have adequate ventilation before cleaning. Do not clean in areas with little or no active ventilation such as storage rooms or closets.
- You must allow the parts to cool for a minimum of 30 minutes before cleaning.
- You must check that there are no ignition sources in the area. These include, but are not limited to, cigarettes, switches, electrical outlets, light bulbs, and flames.
- You must wear neoprene gloves and safety glasses with side shields to prevent contact of cleaning materials and FAZ with the skin and eyes. You must discard the gloves after cleaning (one time use only).
- You must place used alcohol wipes, cleaning pads, and gloves in a bag (SP78999828680). Use a tie wrap on the bag and discard the bag.

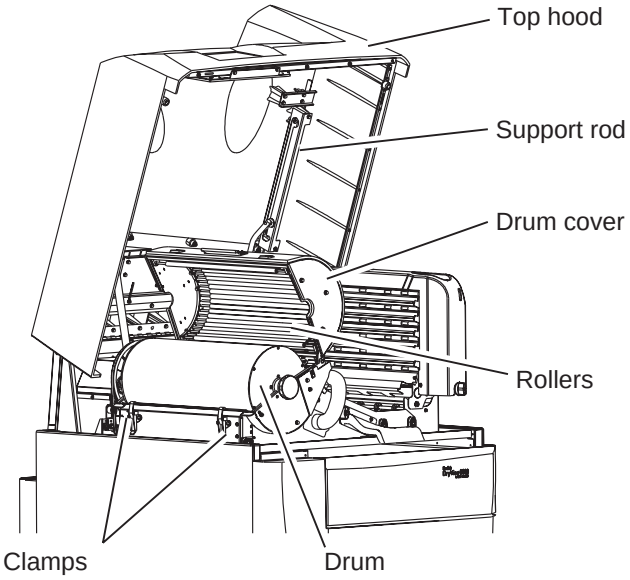
Preparing for Preventive Maintenance

IMPORTANT: *If your container of DMSO cleaner was exposed to low temperature, place the cleaner in warm water for 10 minutes before you begin cleaning.*

1. From the local panel, power down the laser imager.

⚠ *WARNING*:
Dangerous Voltage

2. Disconnect the power cord.



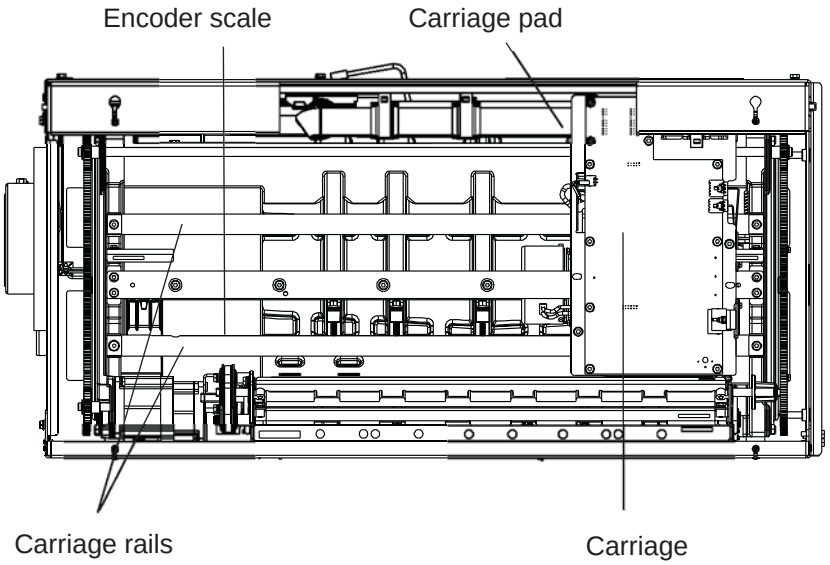
3. Lift the top hood.
4. Lock the support rod.
5. Release the clamps.

IMPORTANT: *The drum and rollers must cool for a minimum of 30 minutes before cleaning.*

6. Open the drum cover.

Cleaning the Carriage Rails

IMPORTANT: *Normal wear of the carriage pads leaves debris on the carriage rails.*

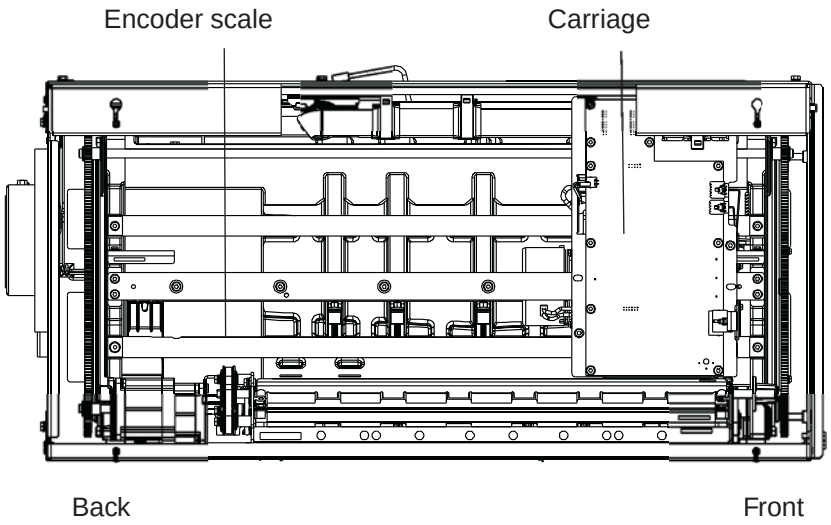


1. Extend the imaging assembly (see "Imaging Assembly" on page 4-1).
2. Move the carriage up and down the rails.
3. Check the rails for debris.

CAUTION:
When cleaning the left rail, do not pull the ends of the encoder scale loose with the lint-free cloth.

4. Use a lint-free cloth to remove any debris from the rails.

Cleaning the Encoder Scales

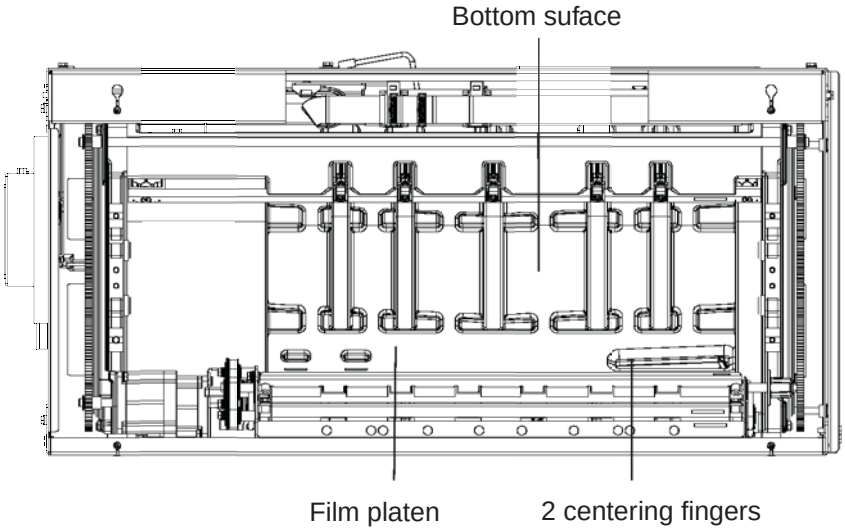


1. Extend the imaging assembly (see "Imaging Assembly" on page 4-1).
2. Move the carriage to the front of the imaging assembly.

CAUTION:
To prevent damage to the ends of the encoder scale, you must start cleaning from the center.

3. Use a new alcohol wipe to carefully clean from the center of the encoder scale to the back end of the scale.
4. Move the carriage to the back of the imaging assembly.
5. Use a new alcohol wipe to carefully clean from the center of the encoder scale to the front end of the scale.

Cleaning the Film Platen



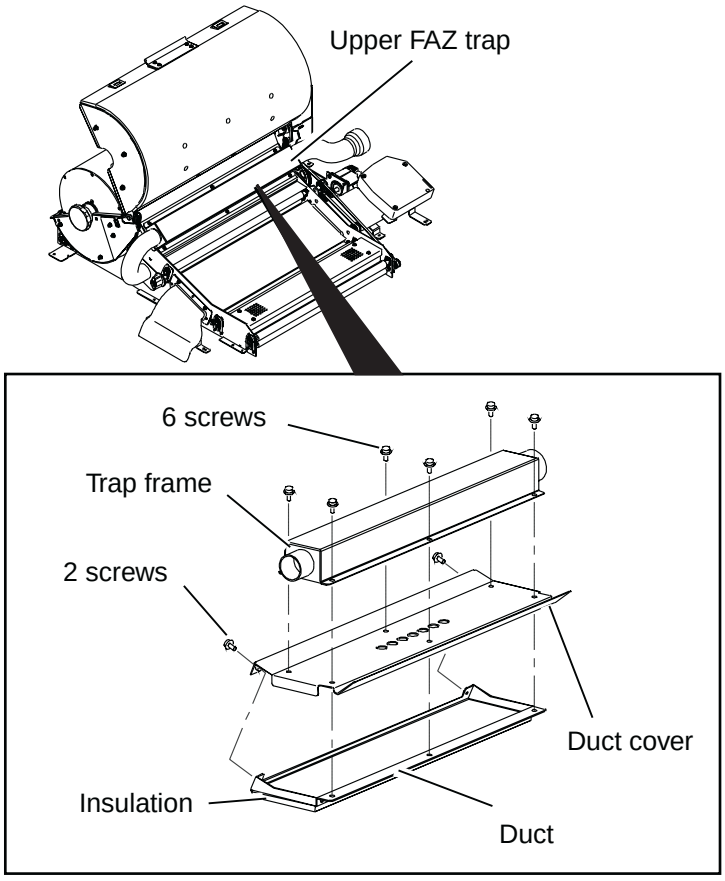
1. Extend the imaging assembly (see "Imaging Assembly" on page 4-1).
2. Use a lint-free cloth to remove any loose debris that is visible on the film platen.

CAUTION:
To prevent damage to the laser imager, follow these precautions:

- Prevent scratches from metal items on the surface of the film platen.
- Do not damage the centering fingers at the front of the film platen.
- Use only a *3M* Auto-Pak tack cloth for cleaning. Alcohol wipes can cause artifacts on the film.

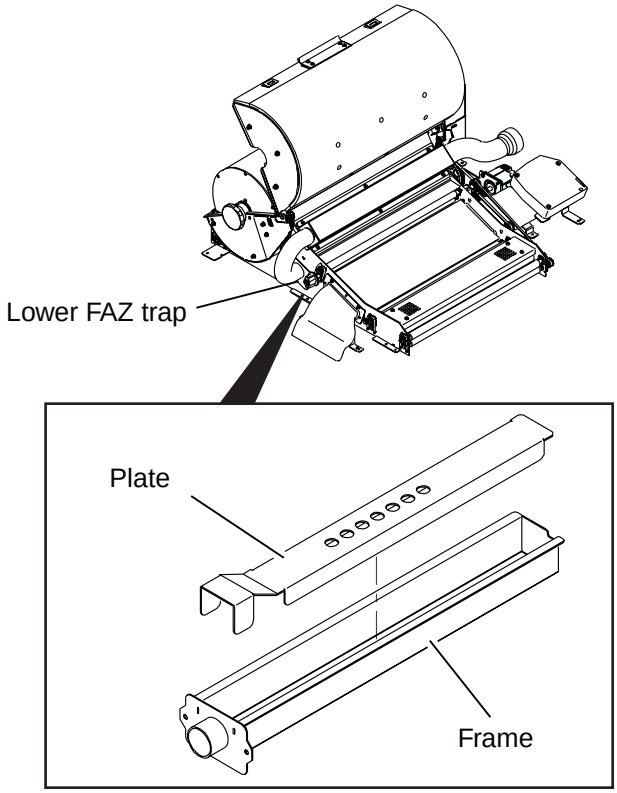
3. Use a tack cloth to clean the bottom surface of the film platen.
4. Install the imaging assembly (see"Imaging Assembly" on page 4-1).

Cleaning the FAZ Traps and Drum Duct

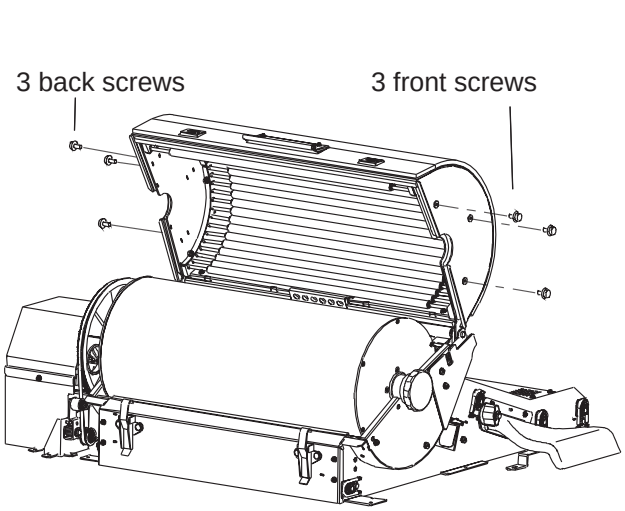


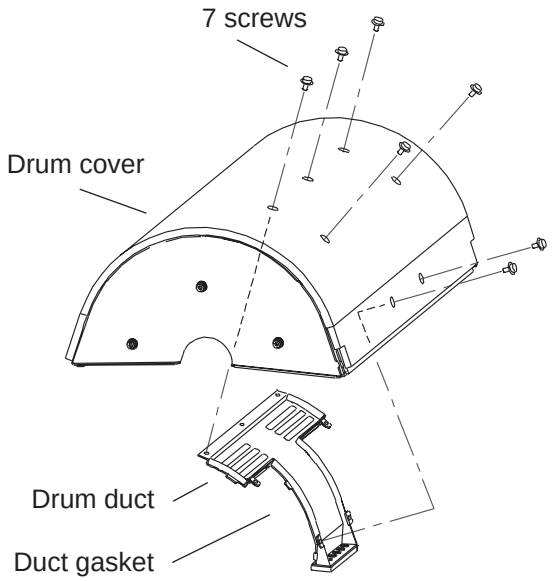
1. Remove the upper FAZ trap (see "Upper FAZ Trap" on page 4-3).
2. Remove:
   - 6 screws
   - Trap frame
   - 2 screws
   - Duct cover
   - Duct
3. Use a scraper to remove FAZ from all metal surfaces.
4. Use alcohol wipes to clean:
   - Insulation
   - Metal surface of duct

5. Place the following parts in a sink for cleaning with DMSO cleaner:
   - Trap frame
   - Duct cover



6. Remove the lower FAZ trap (see "Lower FAZ Trap" on page 4-4).
7. Use a scraper to remove FAZ from all metal surfaces.
8. Place the following parts in a sink for cleaning with DMSO cleaner:
   - Plate
   - Frame





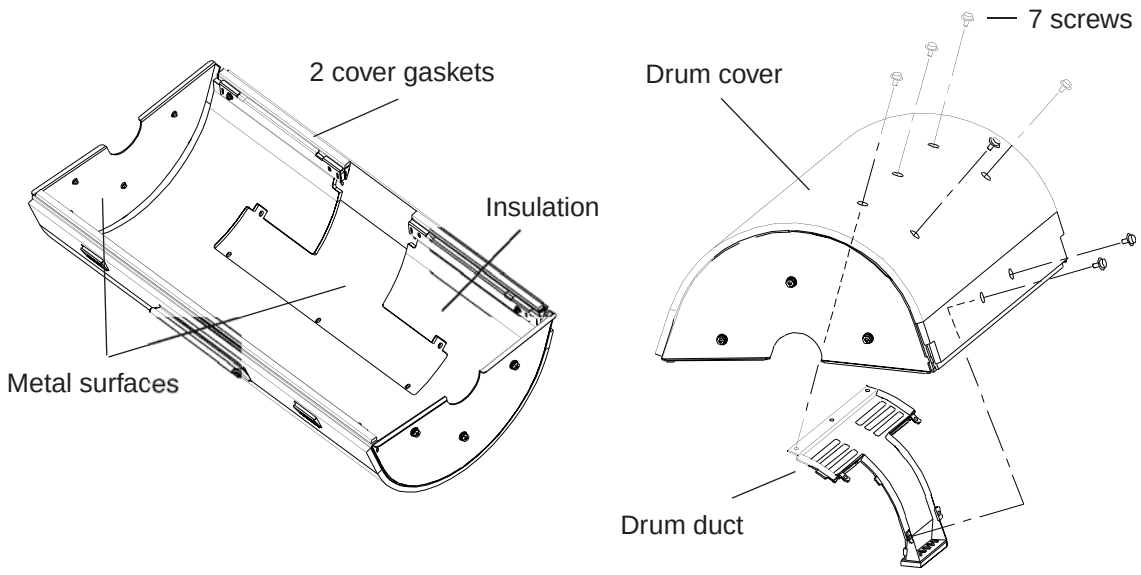
9. Remove the back 3 screws.
10. Hold the drum cover at both ends and carefully close the cover.
11. Remove the front 3 screws.
12. Carefully lift and remove the drum cover.
13. Set the drum cover on a work surface.
14. Remove:
    - 7 screws
    - Drum duct from the cover
15. Use a scraper to remove the duct gasket.
16. Place the drum duct in the sink with the FAZ traps.
17. At the sink, use a scraper to remove residual FAZ from:
    - FAZ traps
    - Drum duct
18. Clean the parts with the cleaning pads soaked in DMSO cleaner.
19. Soak the parts in DMSO cleaner for approximately 5 minutes.
20. Remove:
    - DMSO cleaner with dry cleaning pads
    - Residual FAZ and DMSO cleaner with alcohol wipes

IMPORTANT: *Do not install the FAZ traps or drum duct at this time*.

21. Assemble the 2 FAZ traps.

22. Place used cleaning pads and alcohol wipes in a bag (SP78999828680) for discarding after you have completed cleaning the processor.

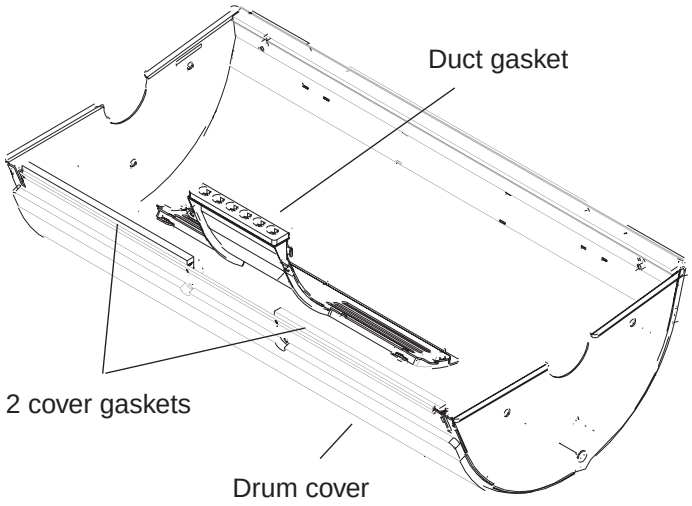
Cleaning the Drum Cover



1. Use a scraper to remove:
   - 2 cover gaskets
   - Thick FAZ from metal surfaces
2. Clean the following items with cleaning pads soaked in DMSO cleaner:
   - Insulation
   - Metal surfaces
3. Remove:
   - DMSO cleaner with dry cleaning pads
   - Residual FAZ and DMSO cleaner with alcohol wipes
4. Install:
   - 7 screws
   - Drum duct in the drum cover
5. Place used cleaning pads and alcohol wipes in a bag (SP78999828680) for discarding after you have completed cleaning the processor.

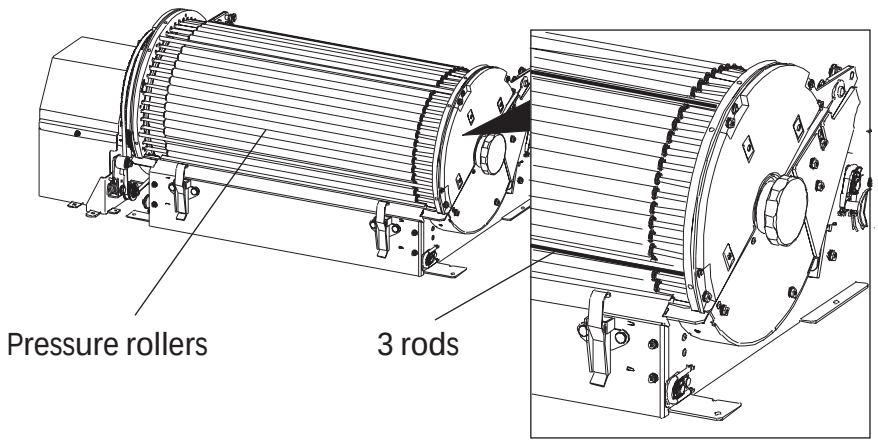
Installing New Cover Gaskets on the Drum Cover

IMPORTANT: *Do not install the drum cover until the pressure rollers and drum are cleaned.*

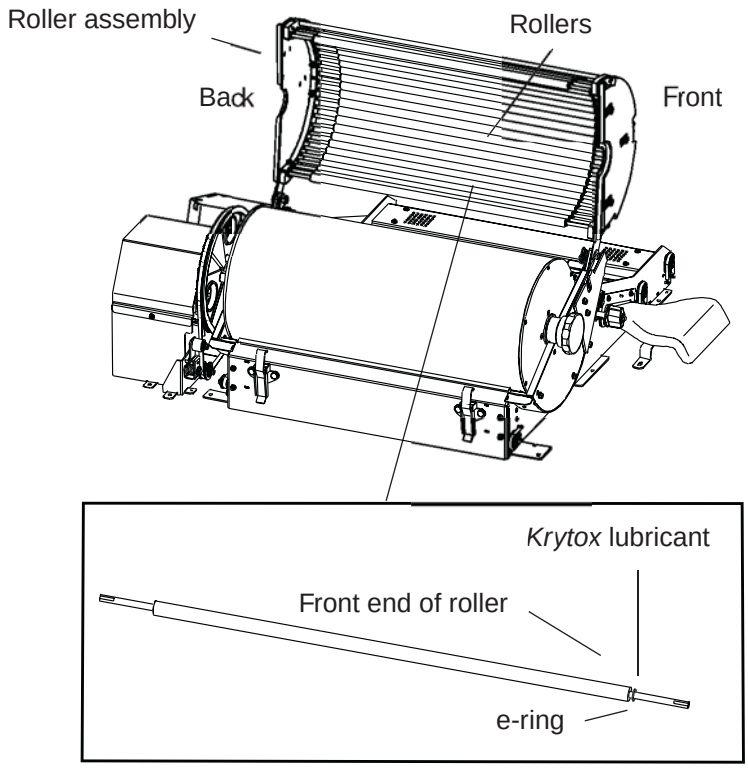


1. Remove the protection strips from the gaskets.
2. Install:
   - Duct gasket
   - Cover gaskets

Cleaning the Pressure Rollers and Applying Lubricant

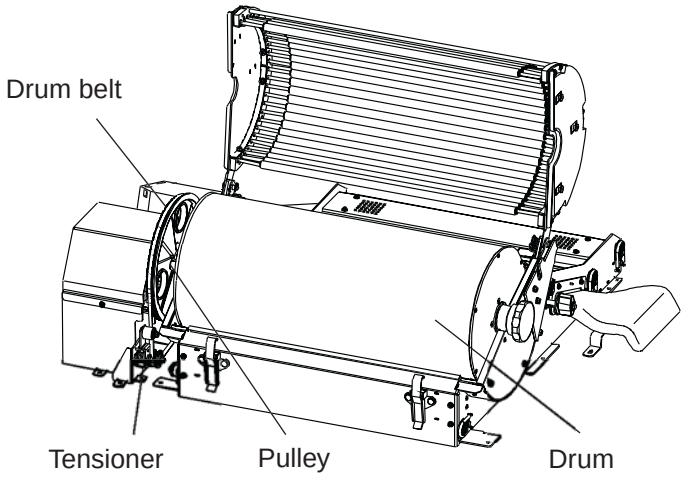


1. Clean the 3 rods and the rollers.
   a. Rotate the rods and clean all surfaces with a scraper.
   b. Vacuum the rollers to remove loosened FAZ.
   c. Rotate the rods and rollers and clean all surfaces from end to end with cleaning pads soaked in DMSO cleaner.
   d. Remove:
      - DMSO cleaner with dry cleaning pads
      - Residual FAZ and DMSO cleaner with alcohol wipes



2. Apply *Krytox* lubricant to the ends of the rollers:
   a. Lift the roller assembly.
   b. Move all the rollers to the back to separate the front ends of the rollers from the e-rings.
   c. Apply one drop of lubricant between the e-ring and the front end of each roller.
   d. Pull all rollers to the front to separate the back ends of the rollers from the e-rings.
   e. Do Step c again for the back end of each roller.
3. Rotate the rollers to distribute the lubricant.
4. Use cleaning pads to clean excessive lubricant from the ends of the rollers.

Cleaning the Drum

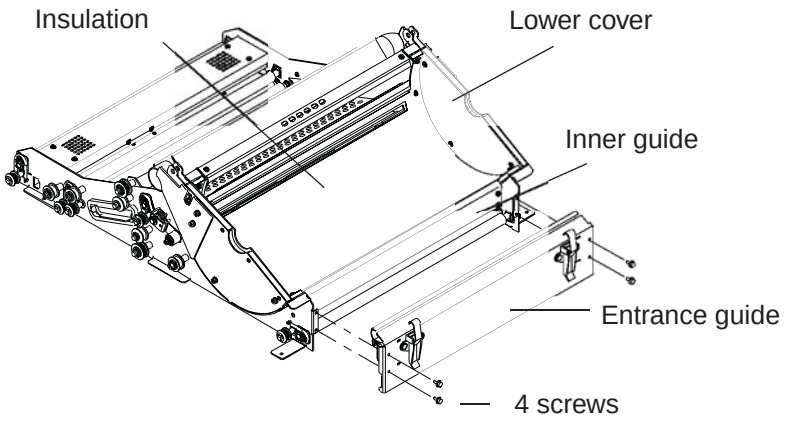


1. Pull on the tensioner and remove the drum belt.
2. Use the pulley to rotate the drum and check for damage.
3. Does the drum have damage?

Yes	No
Install a new processor drum (see "Processor Drum" on page 4-5).	Continue with this procedure.

4. Clean the drum:
   a. Rotate the drum and clean the surface with cleaning pads soaked in DMSO cleaner.
   b. Discard dirty cleaning pads and use new pads.
   c. Do Steps a and b again until:
      - Used cleaning pads have only a light color
      - You have cleaned the surface of the drum from end to end
   d. Remove:
      - DMSO cleaner with dry cleaning pads
      - Residual FAZ and DMSO cleaner with alcohol wipes
5. Place used cleaning pads and alcohol wipes in a bag (SP78999828680) for discarding after you have completed cleaning the processor.

Cleaning the Lower Cover and Entrance Guide



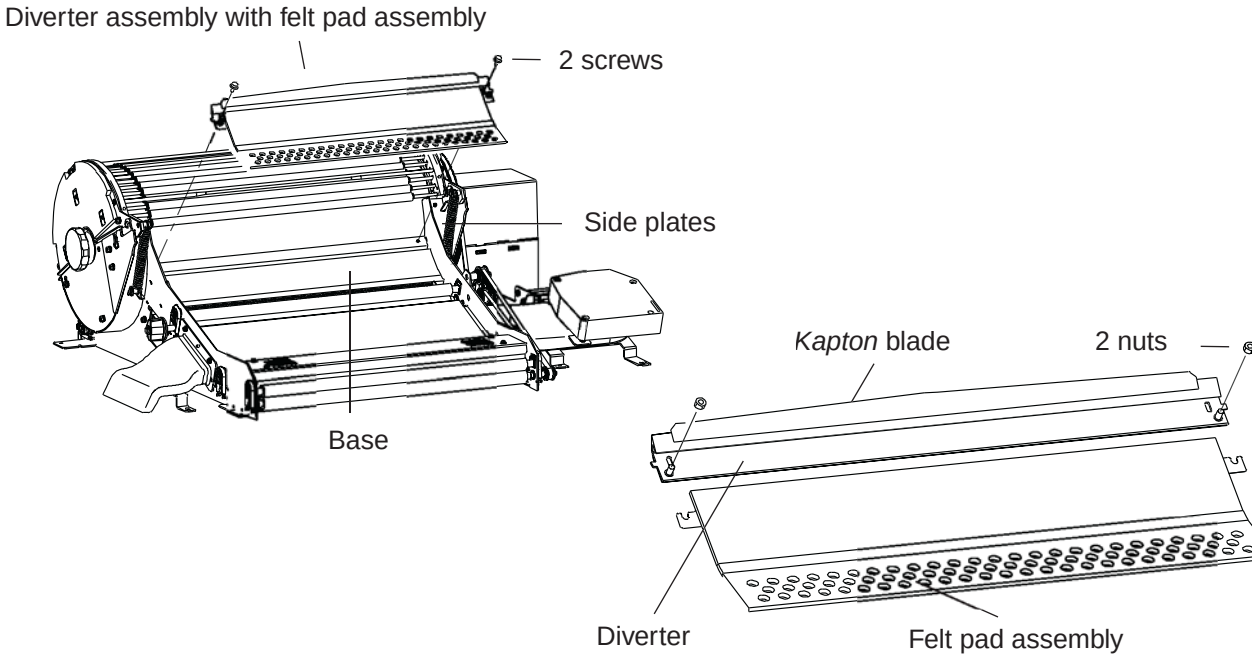
1. Remove the drum from the processor (see "Processor Drum" on page 4-5).
2. Remove:
   - 4 screws
   - Entrance guide
3. Clean the following parts with cleaning pads soaked with DMSO cleaner:
   - Entrance guide
   - Inner guide

CAUTION:
Do not use a scraper on parts with smooth surfaces.

4. If necessary, use a scraper to clean the back of the lower cover.
5. Clean the insulation in the lower cover with cleaning pads soaked with DMSO cleaner.
6. Remove:
   - Loose FAZ from the lower cover with a vacuum cleaner
   - Residual FAZ and DMSO cleaner from all areas with alcohol wipes
7. Install:
   - Entrance guide
   - 4 screws
8. Install the drum (see "Processor Drum" on page 4-5).
9. Place used cleaning pads and alcohol wipes in a bag (SP78999828680) for discarding after you have completed cleaning the processor.

Cleaning the Diverter and Installing a New Felt Pad Assembly

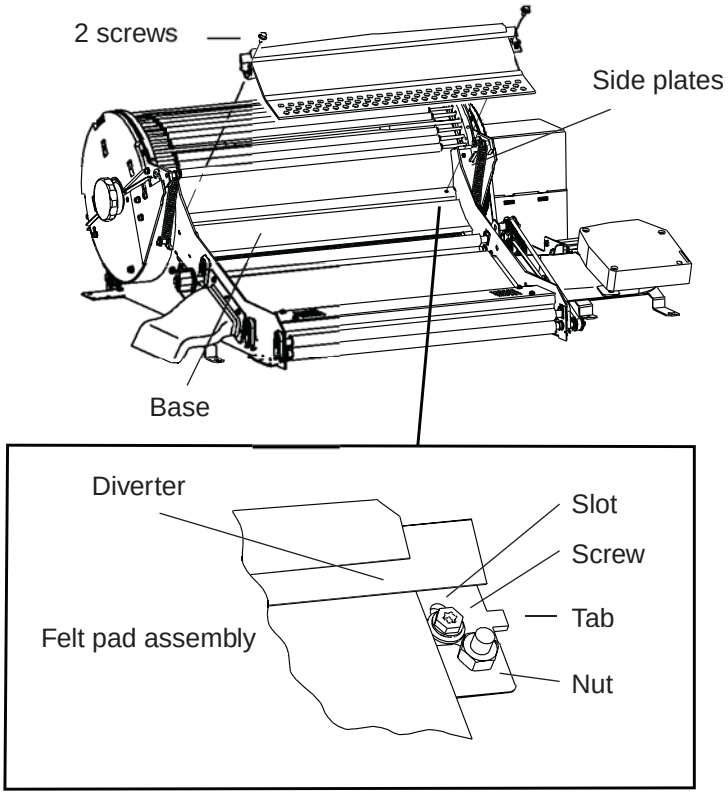
IMPORTANT: *Perform this procedure at 20,000 cycles.*



1. Remove:
   - 2 screws
   - Diverter assembly with felt pad assembly
   - 2 nuts
   - Felt pad assembly from the diverter
2. Clean the following parts with cleaning pads soaked in DMSO cleaner:
   - Diverter
   - *Kapton* blade
3. Remove residual FAZ and DMSO cleaner with alcohol wipes.

⚠ CAUTION:
When you use a scraper in the area of the drum, do not cut the drum.

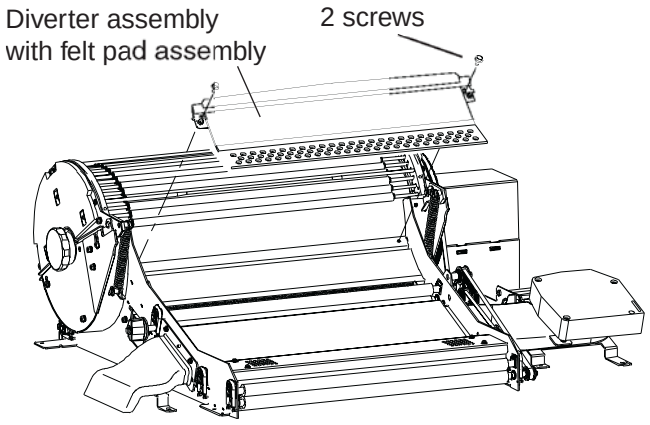
4. Use a scraper to remove FAZ from:
   - Base
   - Side plates
5. Use cleaning pads soaked with DMSO cleaner to clean the base.



6. Remove:
   - Loose FAZ in the area of the base with a vacuum cleaner
   - Residual FAZ and DMSO cleaner with alcohol wipes
7. Insert the new felt pad assembly into the diverter.
8. Install the 2 nuts.
9. Install the diverter assembly and the new felt pad assembly:
   a. Insert the tabs on the ends of the diverter into the side plates.
   b. Install, but do not tighten, the 2 screws.
   c. Move the diverter up until the screws are at the bottom of the slots.
   d. Tighten the 2 screws.
10. Discard the old felt pad assembly.
11. Place used cleaning pads and alcohol wipes in a bag (SP78999828680) for discarding after you have completed cleaning the processor.

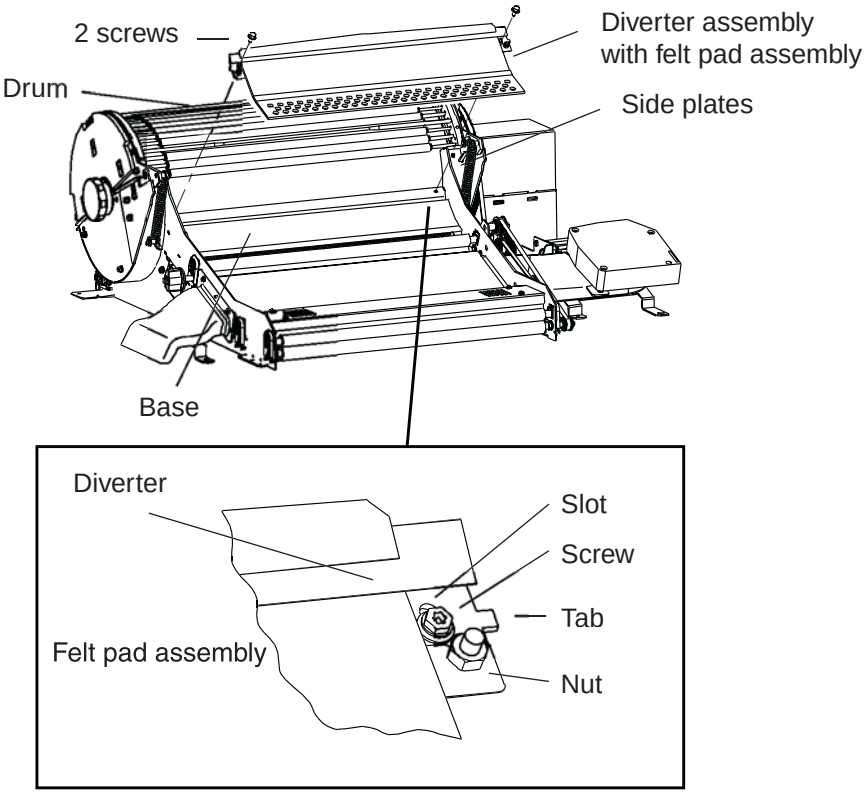
Installing a New Diverter Assembly and Felt Pad Assembly

IMPORTANT: *Perform this procedure at 40,000 cycles.*



1. Remove:
   - 2 screws
   - Diverter assembly with felt pad assembly

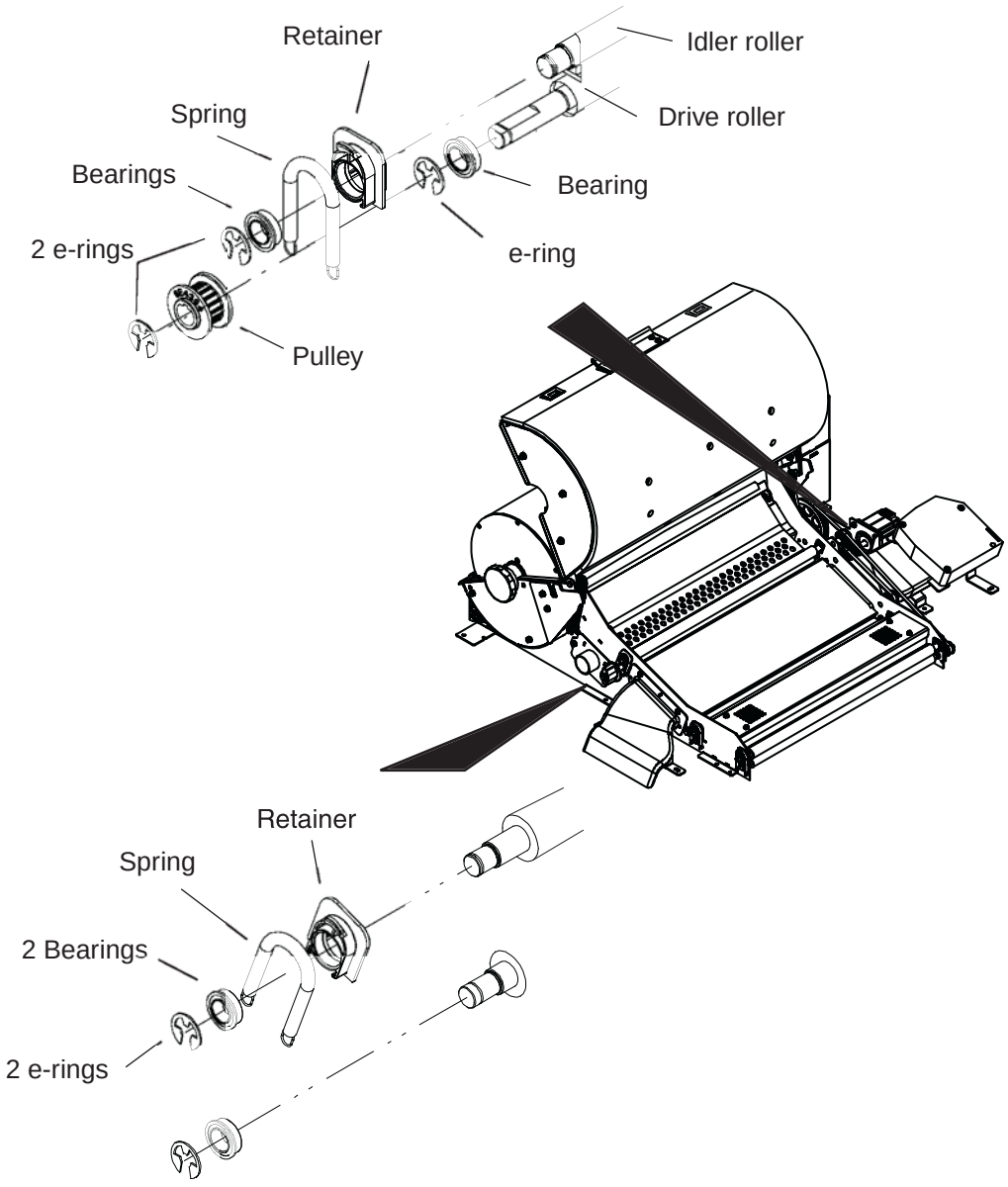
CAUTION:
When you use a scraper in the area of the drum, do not cut the drum.



2. Use a scraper to remove FAZ from:
   - Base
   - Side plates
3. Use cleaning pads soaked in DMSO cleaner to clean the base.
4. Remove:
   - Loose FAZ in the area of the base with a vacuum cleaner
   - Residual FAZ and DMSO cleaner with alcohol wipes
5. Install the new diverter assembly with a new felt pad assembly:
   a. Insert the felt pad assembly into the diverter.
   b. Tighten the 2 nuts.
   c. Insert the tabs on the ends of the diverter into the side plates.
   d. Install, but do not tighten, the 2 screws.
   e. Move the diverter up until the screws are at the bottom of the slots.
   f. Tighten the 2 screws.
6. Discard the old diverter assembly and the old felt pad assembly.
7. Place used cleaning pads and alcohol wipes in a bag (SP78999828680) for discarding after you have completed cleaning the processor.

Installing New Drum Exit Transport Rollers

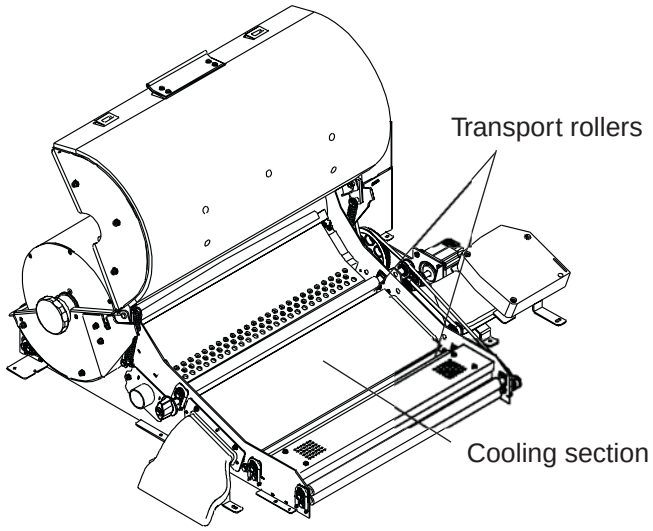
IMPORTANT: *Perform this procedure at 100,000 cycles.*



1. At the front of the processor, remove:
   - 2 e-rings
   - Spring
   - 2 bearings
   - Retainer

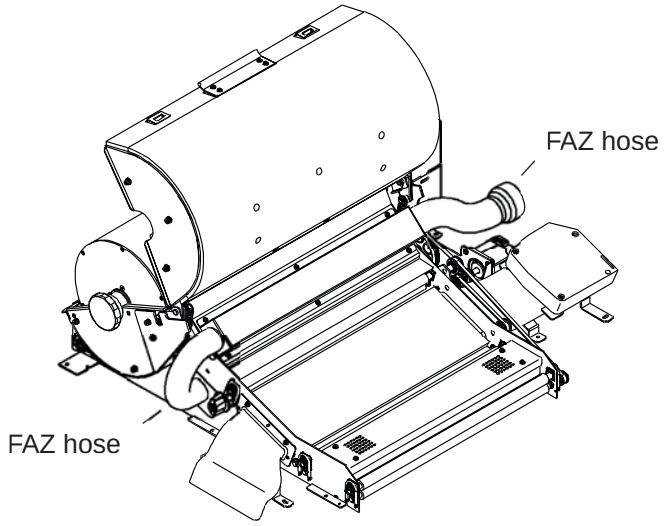
2. At the back of the processor, remove:
   - 2 e-rings
   - Pulley
3. At the back of the processor, remove from the end of the idler roller:
   - Spring
   - Bearing
   - Retainer
4. At the back of the processor, remove from the end of the drive roller:
   - e-ring
   - Bearing
5. Remove the 2 drum exit transport rollers.
6. Install the new drum exit transport rollers in reverse order of the removal procedure.

Cleaning the Cooling Section



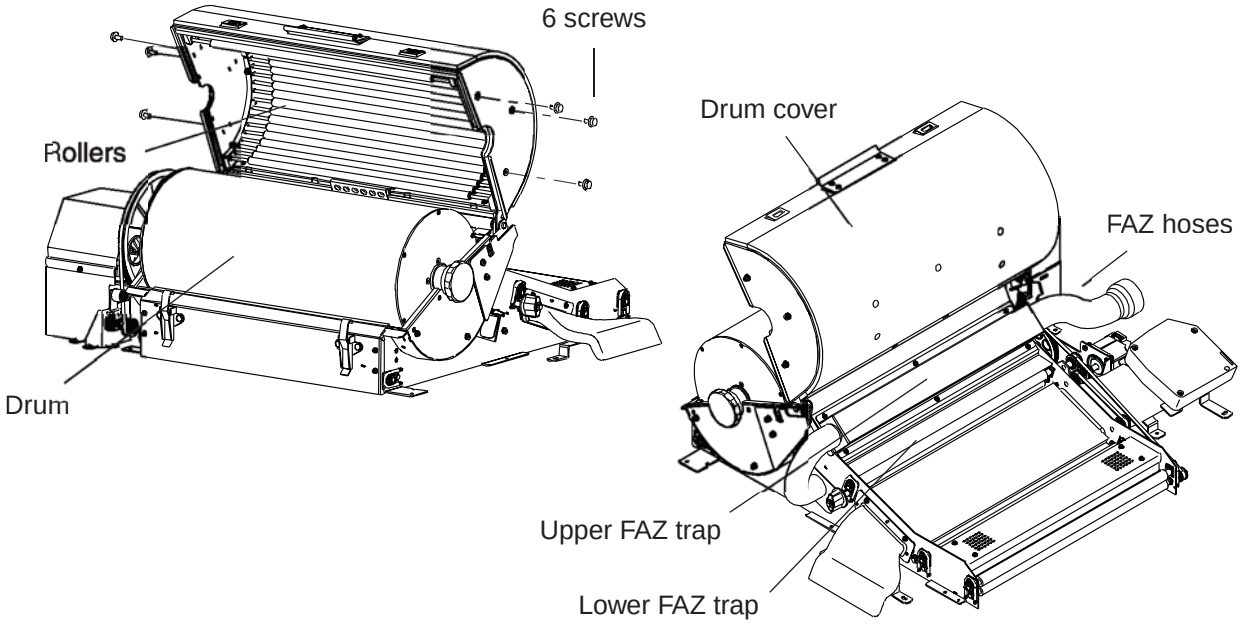
1. Clean the cooling section with cleaning pads soaked in DMSO cleaner.
2. Remove residual FAZ and DMSO cleaner with alcohol wipes.
3. Check for large debris and FAZ on the transport rollers.
4. If necessary, vacuum the area of the cooling section.
5. Place used cleaning pads and alcohol wipes in a bag (SP78999828680) for discarding after you have completed cleaning the processor.

Cleaning the FAZ Hoses



1. Remove the FAZ hoses.
2. Hit the FAZ hoses against the inside of a sink to remove loose FAZ.
3. Vacuum the inside of the FAZ hoses.

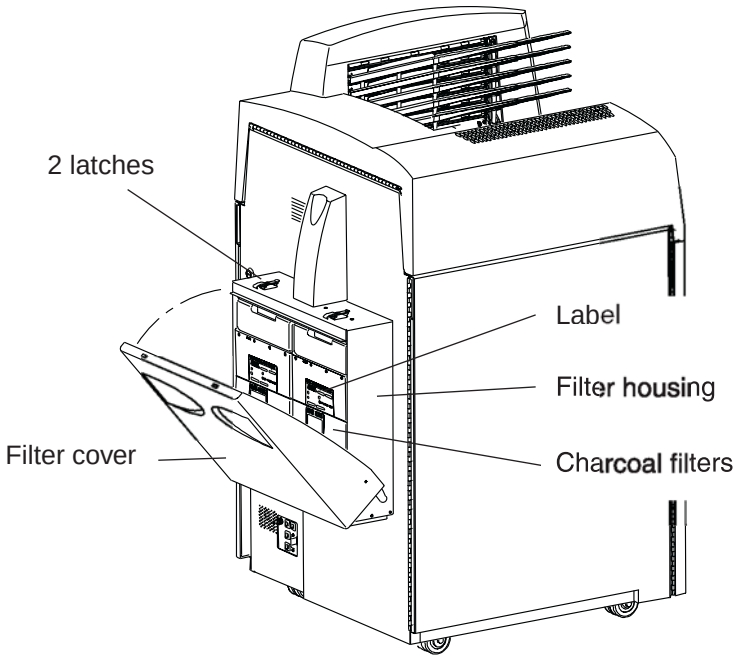
Assembling the Processor



1. Install the drum cover:
   a. Lower the rollers onto the drum.
   b. Place the drum cover in position for installation.
   c. Install the front 3 screws.
   d. Hold the drum cover and rollers at both ends and carefully lift to the up position.
   e. Install the back 3 screws.
2. Install the lower FAZ trap (see "Lower FAZ Trap" on page 4-4).
3. Install the upper FAZ trap (see "Upper FAZ Trap" on page 4-3).
4. Install the FAZ hoses.
5. Discard all used cleaning materials:
   a. Place gloves in a bag (SP78999828680) with pads and wipes.
   b. Place a tie-wrap on the bag.
   c. Discard the bag.

Installing New Charcoal Filters

IMPORTANT: *At 40,000 cycles, see "Cleaning the Charcoal Filter Housing, Upper Plenum, and Duct" on page 3-29 before doing this procedure.*



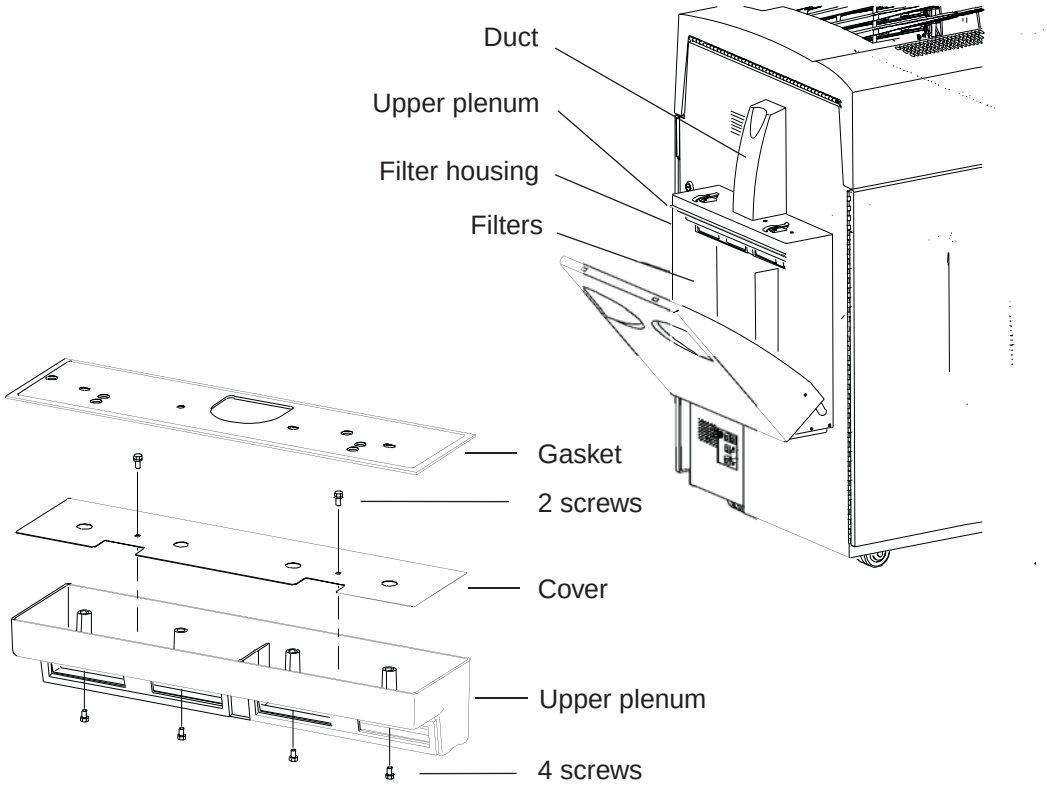
1. Open:
   - 2 latches
   - Filter cover
2. Remove the 2 old charcoal filters.
3. Record the following information on the label of each of the 2 new filters:
   - Cycle count
   - Date
4. Install the 2 new filters.
5. Close:
   - Filter cover
   - 2 latches

⚠ CAUTION:
Filters are not dangerous waste. You must discard filters in a landfill or incinerator with recovery in a municipal or industry area. You must check with your local government to determine if additional requirements apply.

6. Discard the old filters.

Cleaning the Charcoal Filter Housing, Upper Plenum, and Duct

IMPORTANT: *Perform this procedure at 40,000 cycles.*

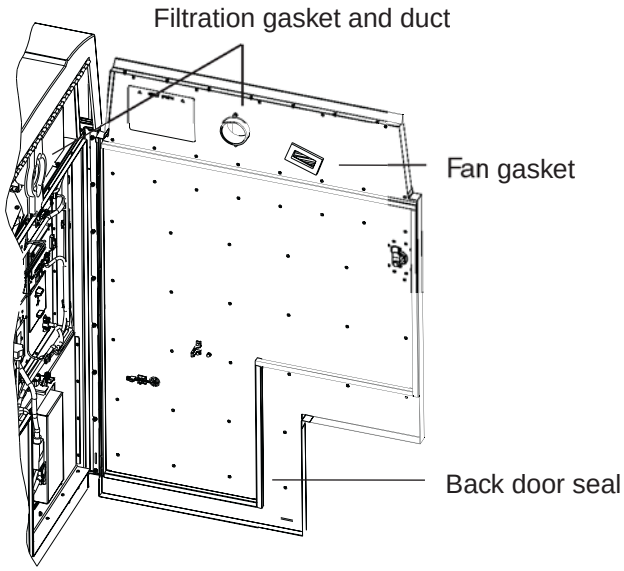


1. Remove the old charcoal filters (see "Installing New Charcoal Filters" on page 3-28).
2. Vacuum the inside of the filter housing.
3. Remove:
   - 4 screws
   - Upper plenum
   - Gasket
   - 2 screws
   - Cover
4. Vacuum the inside of the upper plenum.
5. Clean the cover and gasket with alcohol wipes.
6. Vacuum the duct.

7. Install:
   - Cover
   - 2 screws
   - Gasket
   - Upper plenum
   - 4 screws
8. Install 2 new filters (see "Installing New Charcoal Filters" on page 3-28).

Cleaning the Filtration Gaskets and Back Door Seals

IMPORTANT: *Perform this procedure at 40,000 cycles.*

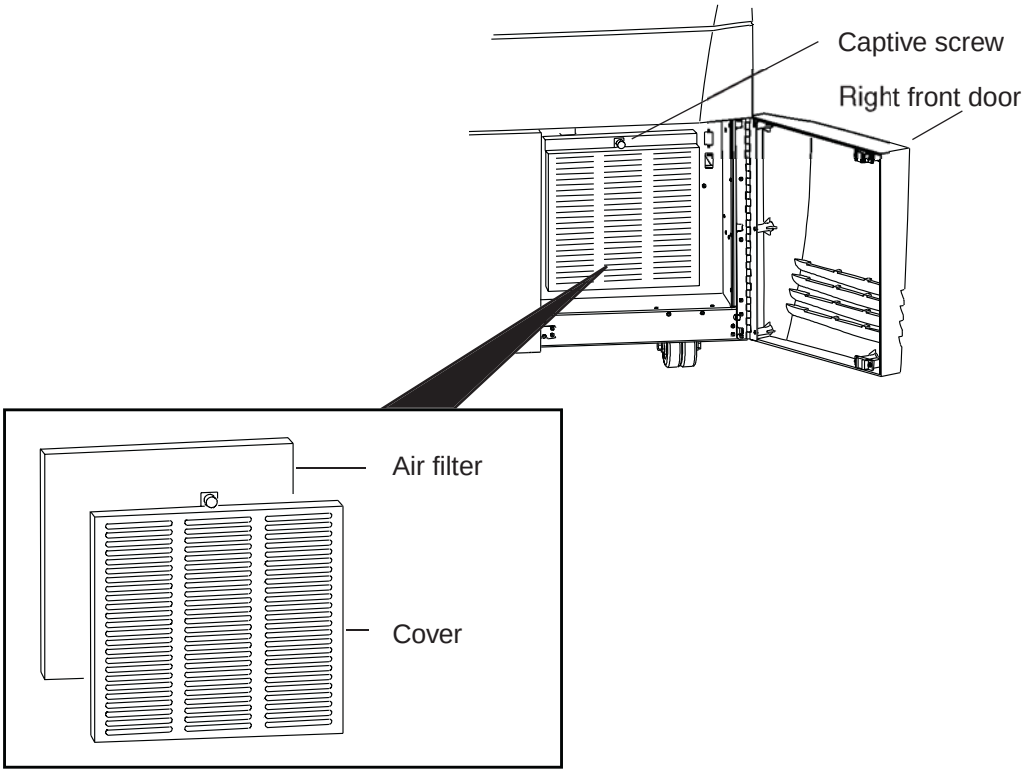


Vacuum:

- FAZ from the filtration gasket and duct
- Fan gasket
- Surface of the back door seal

Installing a New Air Filter

IMPORTANT: *Perform this procedure at 40,000 cycles.*



1. Open the right front door.
2. Loosen the captive screw.
3. Lift to remove the cover with the air filter.
4. Remove the filter from the cover.
5. Install:
   - New air filter in the cover
   - Cover with the filter
6. Tighten the captive screw.
7. Discard the old filter.

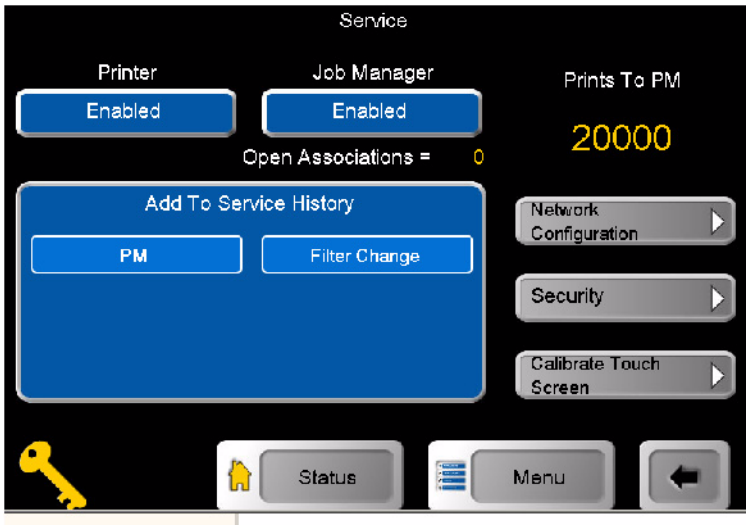
Checking the Operation

1. Connect the power cord.
2. Power up the laser imager.
3. Allow the film processor to warm to "READY."
4. Make a print of an image.
5. Check the quality of the print.

Resetting the Preventive Maintenance Count and Changing the Service History

IMPORTANT: *Use the Service Menu on the local panel to reset the preventive maintenance count to 20,000 and automatically add preventive maintenance data to the "Service History".*

1. Touch [Service] for access to the service function of the local panel.
2. Enter the Service Menu:
   a. For "User ID," type 99.
   b. For "Passcode," type 987654 or your individual passcode.



3. Touch [PM] on the "Add to Service History" screen.

NOTE: This action resets the "Print Counter" to 20,000 and sends this preventive maintenance information to the "Service History."

4. Touch [Filter Change].

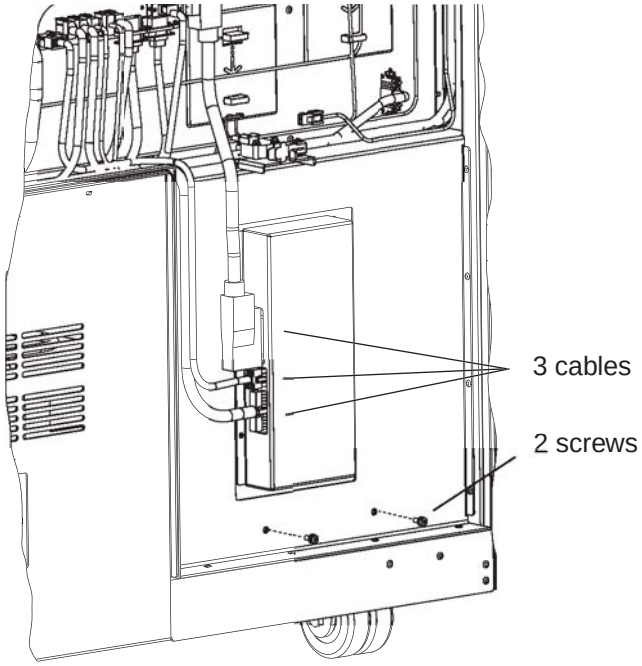
NOTE: This action changes the "Service History" automatically.

4 Replacements

Imaging Assembly

Removing:

IMPORTANT: *This procedure extends the imaging assembly from the laser imager on slides. It does not completely remove the imaging assembly from the laser imager.*

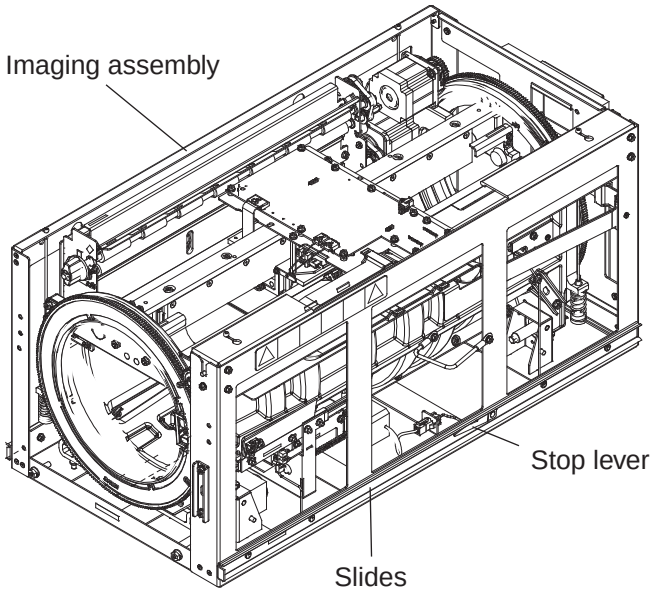


1. From the local panel, power down the laser imager.

***WARNING*:**
Dangerous Voltage

2. Disconnect the power cord.
3. Open the back door.
4. At the back of the laser imager:
   - Disconnect the 3 cables.
   - Remove the 2 screws.
5. Open the front door.
6. Extend the imaging assembly from the laser imager.

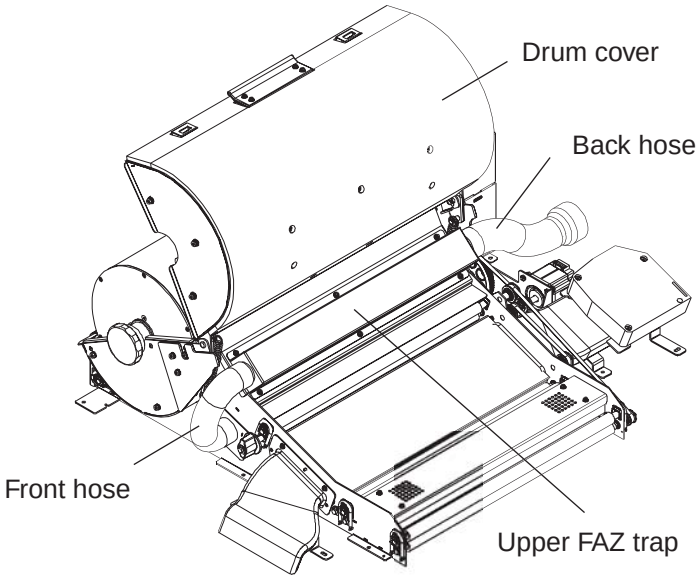
Installing:



1. To move the imaging assembly into the laser imager, release the slides by pressing down on the right stop lever and up on the left stop lever.
2. Reverse the steps in the removal procedure.

Upper FAZ Trap

Removing:



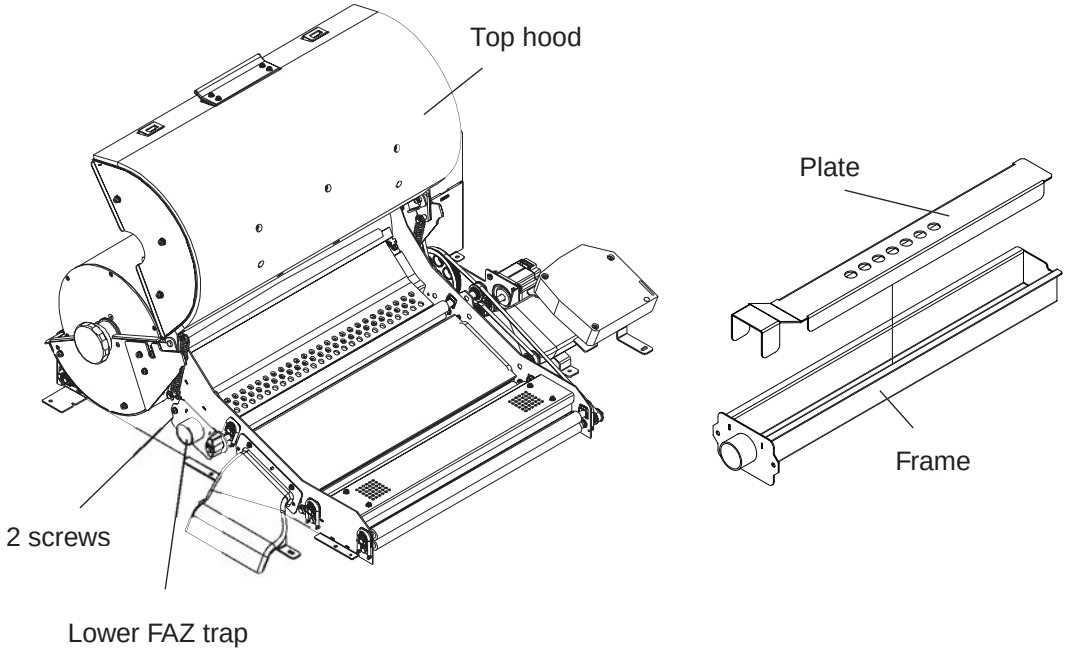
1. Remove:
   - Front hose
   - Back hose
2. Open the drum cover.
3. Tilt and hold the opened drum cover approximately 5 cm (2 in.) toward the closed position.
4. Move the upper FAZ trap a short distance under the drum cover.
5. Lift and remove the upper FAZ trap.
6. Return the drum cover to the fully opened position.

Installing:

Reverse the steps in the removal procedure.

Lower FAZ Trap

Removing:



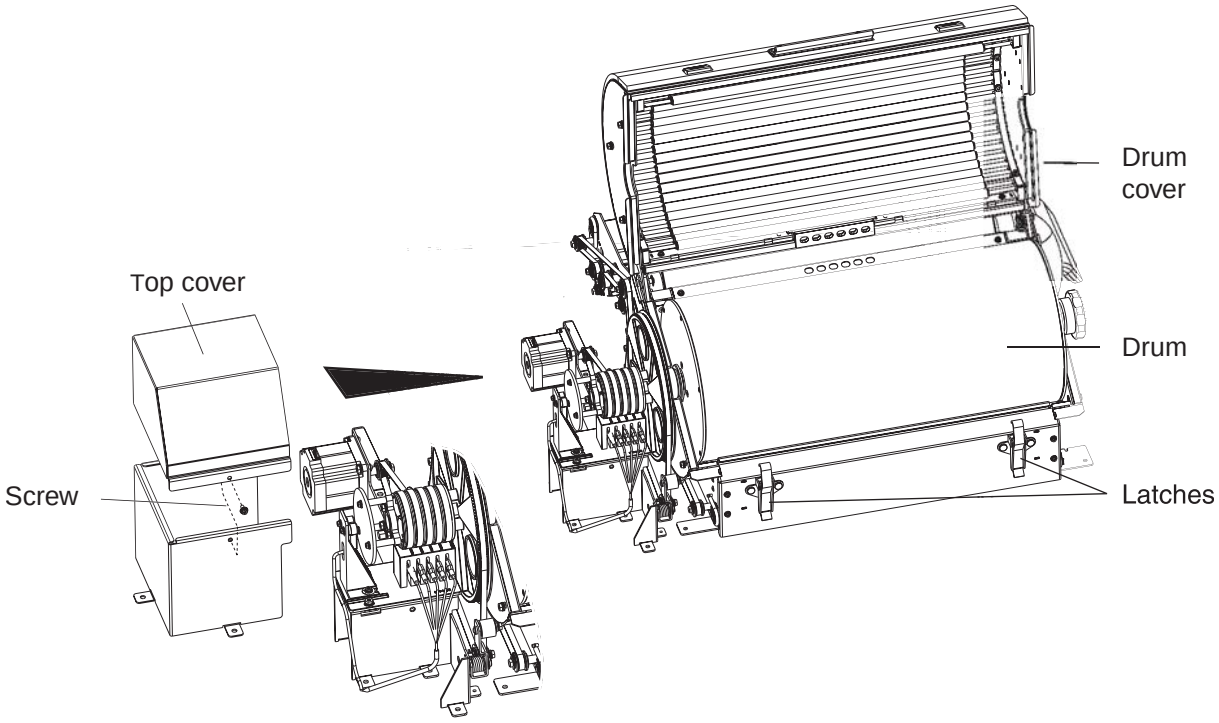
1. Open the top hood.
2. Remove the 2 screws.
3. Pull the lower FAZ trap forward to remove it.
4. Lift the plate from the frame.

Installing:

Reverse the steps in the removal procedure.

Processor Drum

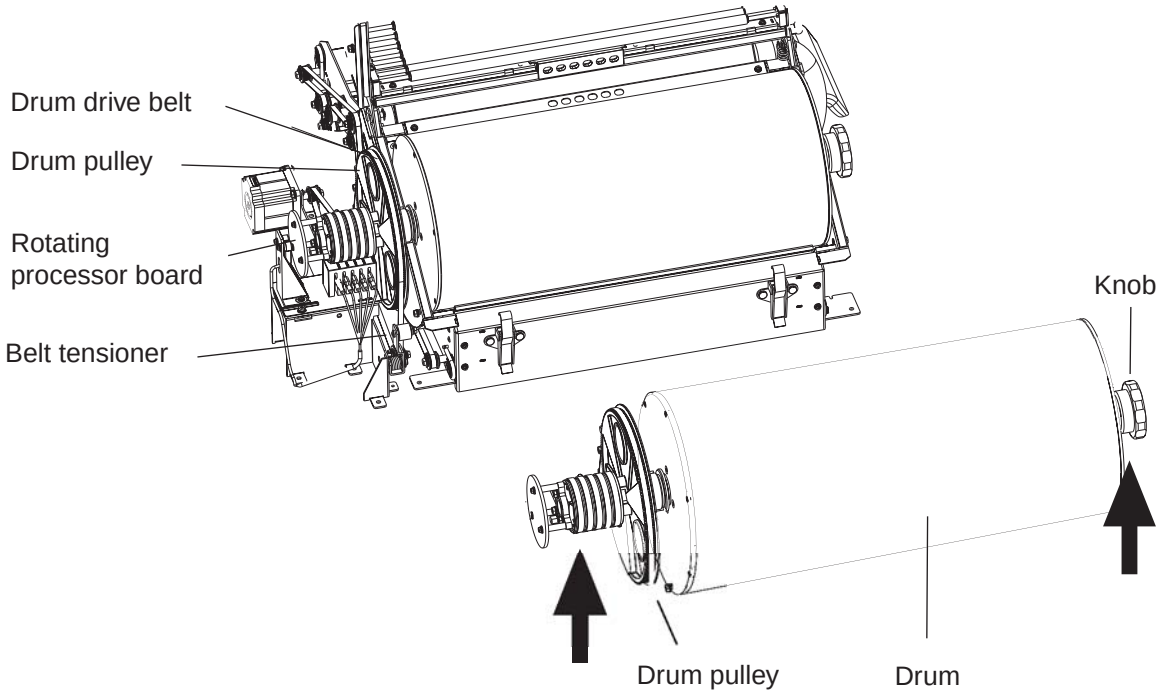
Removing:



1. From the local panel, power down the laser imager.

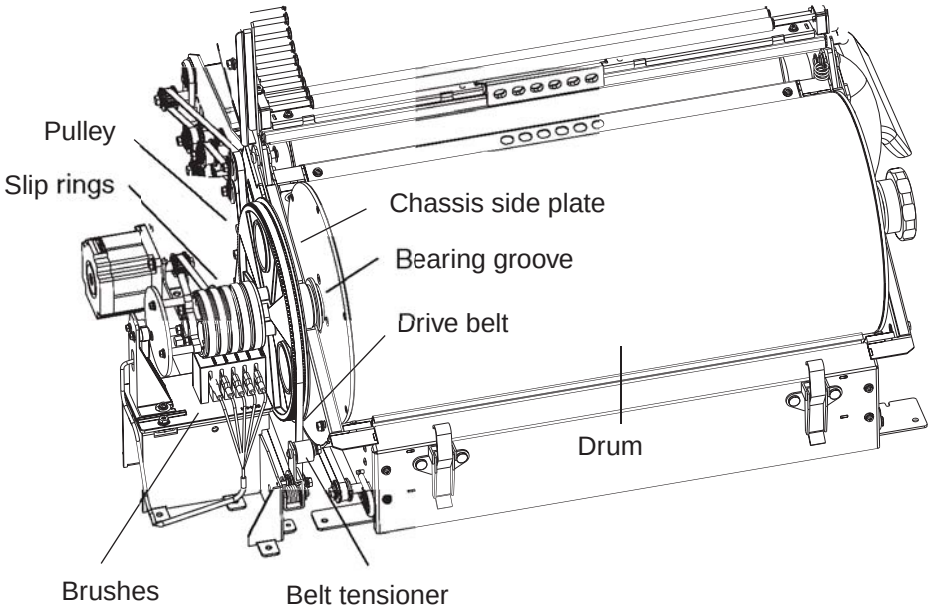
***WARNING*:**
Dangerous Voltage

2. Disconnect the power cord.
3. Open the back door.
4. Release the latches.
5. Open the drum cover.
6. Allow the drum to cool for 20 minutes or longer.
7. Remove:
   - Screw
   - Top cover



8. Loosen the belt tensioner.
9. Remove the drum drive belt from the drum pulley.
10. Set the drum drive belt on the rotating processor board.
11. Holding the drum pulley on one end of the drum and the knob on the other end, lift the drum from the processor.
12. Set the drum on a work surface.

Installing:



1. Reverse the steps in the removal procedure.
2. Check:
   - The bearing groove on the pulley end of the drum is installed in the chassis side plate.
   - The slip rings are aligned on the brushes.
   - The drive belt is placed on the belt tensioner.

5 Troubleshooting

Status and Error Messages

Occasionally, you may have to correct minor problems. If more serious malfunctions occur, you must contact an Authorized Service Provider of Kodak products (see "Calling for Support" on page 6-1).

To determine the operator action required, monitor the laser imager operation and note the laser imager status and error messages.

Local Panel Status Messages

The **Status** screen displays messages to provide information on the overall status and activities of the *Kodak DryView* 8900 Laser Imager. The **Status** screen also displays more detailed information on each film drawer.

Main Status Screen	Details
Self-Test	Occurs when the power is first applied to the machine control system.
Ready	The printer is online and the processor has reached operating temperature.
Warming = xx	The processor is currently warming. xx represents the number of minutes estimated until ready.
Stopped	An error has occurred that prevents printing.
Printing	The laser imager is currently printing.
Door open	The front or back door is open.
Hood open	The hood is open.
Printer offline	Printing has been suspended.
Energy Save	The processor heater is off.
Door open requested	The printer is completing prints in progress.
Sorter disabled	Film is directed to the default bin.
Drawer open	At least one of the film drawers is open.
Shutdown requested	The printer is completing prints in progress.
Service mode	The service override switch is enabled.

Main Status Screen	Details
Preventive Maintenance indicator	Call an Authorized Service Provider of Kodak products to schedule preventive maintenance.
Film Drawer Status Messages	**Details**
Opening... Please wait	The film cartridge is currently opening.
Open	The film supply drawer is open.
Calibrating... Please wait	A calibration is in progress for this film cartridge.
Not Calibrated	The film cartridge is not calibrated.
Fail	An error has occurred, affecting normal operation.
No Cartridge	There is currently no cartridge in the film supply drawer.
Open Requested ... Please Wait	A request to open the film supply drawer is pending.
Job Manager Status Message	**Details**
Active	The laser imager can accept job requests and film is available.
No Media	The laser imager can accept job requests, but film is not available for at least 1 current job.
Offline	The laser imager will not accept any DICOM job requests.

Local Panel Error Messages

The following table lists the error messages displayed on the local panel. When an error message is displayed, perform the operator action listed in the table for that message.

When an error message occurs, an audible alarm will sound.

To silence the audible alarm:

1. When an error message appears, touch anywhere in the error pop-up menu.
2. When a no-media message appears, touch any tray button or the **Job Management** button on the **Status** screen.

NOTE: The laser imager prints a job only with the specified size/media base type requested. If the size/base is not loaded, the print request is put into the "No Media" queue and the laser imager waits for the correct type to be loaded.

If this action does not clear the error message, call an Authorized Service Provider of Kodak products. When you make a service call, be prepared with the error message and message number (see "Calling for Support" on page 6-1).

Preventive Maintenance Icon

NOTE: The laser imager displays a local panel icon when preventive maintenance and cleaning are recommended. Preventive maintenance and cleaning ensure optimum laser imager performance. The preventive maintenance message will not interfere with normal operation and is intended to let you schedule a convenient time for preventive maintenance performed by an Authorized Service Provider of Kodak products.

Operator Actions

The action "Restart the laser imager" means to shut down and restart the laser imager. To restart the laser imager:

1. Touch the **Power** icon on the local panel.
2. Touch the **Restart** icon and select **Yes**. The laser imager will restart automatically.

The action to "open door manually" is described in "Film Drawers and Door Override Latches" on page 5-22.

The action to "close the film cartridge" is described in "Manually Closing the Film Cartridge Lid" on page 5-23.

Number	Message Display	Message Details	Operator Action
02-104	Inadequate Disk Space for New Job	Too many jobs in the Undelivered or No Media queue.	1. Delete jobs in the Undelivered Queue. 2. Load requested media for jobs in pending queue.
03-111	Undelivered Job due to Rendering Error	Job failed because of bad image data.	Delete job from the Undelivered Queue.
10-001	Delivery Server Internal Error	The laser imager can no longer accept jobs.	1. Restart the laser imager. 2. If the error persists, call an Authorized Service Provider of Kodak products.
10-003	Delivery Server Image Datapath Error	The laser imager can no longer accept jobs.	1. Restart the laser imager. 2. If the error persists, call an Authorized Service Provider of Kodak products.
10-910	MCS Communication Down	Jobs will continue to be queued, but new film will not be initiated.	1. Restart the laser imager. 2. If the error persists, call an Authorized Service Provider of Kodak products.
20-154	Internal Communication Failure: MCS	Jobs will continue to be queued. Film affected by the error will be reprinted.	1. Restart the laser imager. 2. If the error persists, call an Authorized Service Provider of Kodak products.
20-208	Front Door Failed to Open	Jobs will continue to be queued. Film affected by the error will be reprinted.	1. Open the door manually. 2. If the error persists, call an Authorized Service Provider of Kodak products.
20-209	Laser Imager Opened During Self Test	Jobs will continue to be queued, but new film will not be initiated.	1. Close any open drawer, door, or hood. 2. Restart the laser imager. 3. If the error persists, call an Authorized Service Provider of Kodak products.

Number	Message Display	Message Details	Operator Action
20-914	Internal Image Data Transfer Failed	Jobs will continue to be queued. Film affected by the error will be reprinted.	1. Restart the laser imager. 2. If the error persists, call an Authorized Service Provider of Kodak products.
20-915	Internal Image Data Transfer Failed	Jobs will continue to be queued. Film affected by the error will be reprinted.	1. Restart the laser imager. 2. If the error persists, call an Authorized Service Provider of Kodak products.
21-116	Film Jam in Area 1: Film Pickup	Jobs will continue to be queued. Printing will continue from any other supply drawer.	1. Open the drawer. 2. Close the cartridge to prevent film from fogging. 3. Remove any film. 4. Close the drawer.
21-118	Internal Hardware Failure: Film Pickup	Jobs will continue to be queued. Printing will continue from any other supply drawer.	1. Restart the laser imager. 2. If the problem persists, call an Authorized Service Provider of Kodak products.
21-119	Internal Hardware Failure: Film Pickup	Jobs will continue to be queued. Printing will continue from any other supply drawer.	1. Restart the laser imager. 2. If the error persists, call an Authorized Service Provider of Kodak products.
21-120	Internal Hardware Failure: Film Pickup	Jobs will continue to be queued. Printing will continue from any other supply drawer.	1. Restart the laser imager. 2. If the error persists, call an Authorized Service Provider of Kodak products.
21-125	Internal Hardware Failure: Feed Rollers	Jobs will continue to be queued. Printing will continue from any other supply drawer.	1. Restart the laser imager. 2. If the error persists, call an Authorized Service Provider of Kodak products.

Number	Message Display	Message Details	Operator Action
21-126	Film Jam in Area 1: Feed Rollers	Jobs will continue to be queued. Film affected by the error will be reprinted.	1. Open the drawer. 2. Close the cartridge to prevent film from fogging. 3. Remove any film. 4. Close the drawer.
21-135	Drawer Failed to Open	Jobs will continue to be queued. Film affected by the error will be reprinted.	1. Open the drawer manually. 2. If the error persists, call an Authorized Service Provider of Kodak products.
21-139	Unable to Identify Film Cartridge	Jobs will continue to be queued. Printing will continue from any other supply drawer.	1. Try a new film cartridge. 2. If the error persists, call an Authorized Service Provider of Kodak products.
21-145	Unsupported Media Type	Jobs will continue to be queued. Printing will continue from any other supply drawer.	1. Try a new film cartridge. 2. If the error persists, call an Authorized Service Provider of Kodak products.
21-146	Unsupported Media Size	Jobs will continue to be queued. Printing will continue from any other supply drawer.	1. Try a new film cartridge. 2. If the error persists, call an Authorized Service Provider of Kodak products.
21-175	Rollback failed to Engage Cartridge	Jobs will continue to be queued. Printing will continue from any other supply drawer.	1. Try a new film cartridge. 2. If the error persists, call an Authorized Service Provider of Kodak products.
21-176	Film Cartridge Failed to Fully Open	Jobs will continue to be queued. Printing will continue from any other supply drawer.	1. Try a new film cartridge. 2. If the error persists, call an Authorized Service Provider of Kodak products.

Number	Message Display	Message Details	Operator Action
21-177	Film Cartridge Failed to Close	Jobs will continue to be queued. Printing will continue from any other supply drawer.	1. Open the drawer. 2. Close the cartridge to prevent film from fogging. 3. Close the drawer. 4. If the error persists, call an Authorized Service Provider of Kodak products.
21-178	Film Cartridge Failed to Open	Jobs will continue to be queued. Printing will continue from any other supply drawer.	1. Try a new film cartridge. 2. If the error persists, call an Authorized Service Provider of Kodak products.
21-179	Film Cartridge Failed to Close	Jobs will continue to be queued. Printing will continue from any other supply drawer.	1. Open the drawer. 2. Close the cartridge to prevent film from fogging. 3. Close the drawer. 4. If the error persists, call an Authorized Service Provider of Kodak products.
21-631	Calibration Failed: Film Dmin Outside Target	Jobs will continue to be queued. Printing will continue from any other supply drawer.	1. Try a new film cartridge. 2. If the error persists, disable AIQC for this film cartridge.
21-632	Calibration Failed: Film Dmax Outside Target	Jobs will continue to be queued. Printing will continue from any other supply drawer.	1. Try a new film cartridge. 2. If the error persists, disable AIQC for this film cartridge.
21-624	Calibration Failed: Film Density Readings not Monotonic	Jobs will continue to be queued. Printing will continue from any other supply drawer.	1. Try a new film cartridge. 2. If the error persists, call an Authorized Service Provider of Kodak products.

Number	Message Display	Message Details	Operator Action
22-116	Film Jam in Area 1: Film Pickup	Jobs will continue to be queued. Printing will continue from any other supply drawer.	1. Open the drawer. 2. Close the cartridge to prevent film from fogging. 3. Remove any film. 4. Close the drawer.
22-118	Internal Hardware Failure: Film Pickup	Jobs will continue to be queued. Printing will continue from any other supply drawer.	1. Restart the laser imager. 2. If the error persists, call an Authorized Service Provider of Kodak products.
22-119	Internal Hardware Failure: Film Pickup	Jobs will continue to be queued. Printing will continue from any other supply drawer.	1. Restart the laser imager. 2. If the error persists, call an Authorized Service Provider of Kodak products.
22-120	Internal Hardware Failure: Film Pickup	Jobs will continue to be queued. Printing will continue from any other supply drawer.	1. Restart the laser imager. 2. If the error persists, call an Authorized Service Provider of Kodak products.
22-125	Internal Hardware Failure: Feed Rollers	Jobs will continue to be queued. Printing will continue from any other supply drawer.	1. Restart the laser imager. 2. If the error persists, call an Authorized Service Provider of Kodak products.
22-126	Film Jam in Area 1: Feed Rollers	Jobs will continue to be queued. Film affected by the error will be reprinted.	1. Open the drawer. 2. Close the cartridge to prevent film from fogging. 3. Remove any film. 4. Close the drawer.
22-135	Drawer Failed to Open	Jobs will continue to be queued. Film affected by the error will be reprinted.	1. Open the drawer manually. 2. If the error persists, call an Authorized Service Provider of Kodak products.

Number	Message Display	Message Details	Operator Action
22-139	Unable to Identify Film Cartridge	Jobs will continue to be queued. Printing will continue from any other supply drawer.	1. Try a new film cartridge. 2. If the error persists, call an Authorized Service Provider of Kodak products.
22-145	Unsupported Media Type	Jobs will continue to be queued. Printing will continue from any other supply drawer.	1. Try a new film cartridge. 2. If the error persists, call an Authorized Service Provider of Kodak products.
22-146	Unsupported Media Size	Jobs will continue to be queued. Printing will continue from any other supply drawer.	1. Try a new film cartridge. 2. If the error persists, call an Authorized Service Provider of Kodak products.
22-175	Rollback Failed to Engage Cartridge	Jobs will continue to be queued. Printing will continue from any other supply drawer.	1. Try a new film cartridge. 2. If the error persists, call an Authorized Service Provider of Kodak products.
22-176	Film Cartridge Failed to Open	Jobs will continue to be queued. Printing will continue from any other supply drawer.	1. Try a new film cartridge. 2. If the error persists, call an Authorized Service Provider of Kodak products.
22-177	Film Cartridge Failed to Close	Jobs will continue to be queued. Printing will continue from any other supply drawer.	1. Open the drawer. 2. Close the cartridge to prevent film from fogging. 3. Close the drawer. 4. If the error persists, call an Authorized Service Provider of Kodak products.
22-178	Film Cartridge Failed to Open	Jobs will continue to be queued. Printing will continue from any other supply drawer.	1. Try a new film cartridge. 2. If the error persists, call an Authorized Service Provider of Kodak products.

Number	Message Display	Message Details	Operator Action
22-179	Film Cartridge Failed to Close	Jobs will continue to be queued. Printing will continue from any other supply drawer.	1. Open the drawer. 2. Close the cartridge to prevent film from fogging. 3. Close the drawer. 4. If the error persists, call an Authorized Service Provider of Kodak products.
22-624	Calibration Failed: Film Density Readings not Monotonic	Jobs will continue to be queued. Printing will continue from any other supply drawer.	1. Try a new film cartridge. 2. If the error persists, call an Authorized Service Provider of Kodak products.
22-631	Calibration Failed: Film Dmin Outside Target	Jobs will continue to be queued. Printing will continue from any other supply drawer.	1. Try a new film cartridge. 2. If the error persists, disable AIQC for this film cartridge.
22-632	Calibration Failed: Film Dmax Outside Target	Jobs will continue to be queued. Printing will continue from any other supply drawer.	1. Try a new film cartridge. 2. If the error persists, disable AIQC for this film cartridge.
23-116	Film Jam in Area 1: Film Pickup	Jobs will continue to be queued. Printing will continue from any other supply drawer.	1. Open the drawer. 2. Close the cartridge to prevent film from fogging. 3. Remove any film. 4. Close the drawer.
23-118	Internal Hardware Failure: Film Pickup	Jobs will continue to be queued. Printing will continue from any other supply drawer.	1. Restart the laser imager. 2. If the error persists, call an Authorized Service Provider of Kodak products.
23-119	Internal Hardware Failure: Film Pickup	Jobs will continue to be queued. Printing will continue from any other supply drawer.	1. Restart the laser imager. 2. If the error persists, call an Authorized Service Provider of Kodak products.

Number	Message Display	Message Details	Operator Action
23-120	Internal Hardware Failure: Film Pickup	Jobs will continue to be queued. Printing will continue from any other supply drawer.	1. Restart the laser imager. 2. If the error persists, call an Authorized Service Provider of Kodak products.
23-125	Internal Hardware Failure: Feed Rollers	Jobs will continue to be queued. Printing will continue from any other supply drawer.	1. Restart the laser imager. 2. If the error persists, call an Authorized Service Provider of Kodak products.
23-126	Film Jam in Area 1: Feed Rollers	Jobs will continue to be queued. Film affected by the error will be reprinted.	1. Open the drawer. 2. Close the cartridge to prevent film from fogging. 3. Remove any film. 4. Close the drawer.
23-135	Drawer Failed to Open	Jobs will continue to be queued. Film affected by the error will be reprinted.	1. Open the drawer manually. 2. If the error persists, call an Authorized Service Provider of Kodak products.
23-139	Unable to Identify Film Cartridge	Jobs will continue to be queued. Printing will continue from any other supply drawer.	1. Try a new film cartridge. 2. If the error persists, call an Authorized Service Provider of Kodak products.
23-145	Unsupported Media Type	Jobs will continue to be queued. Printing will continue from any other supply drawer.	1. Try a new film cartridge. 2. If the error persists, call an Authorized Service Provider of Kodak products.
23-146	Unsupported Media Size	Jobs will continue to be queued. Printing will continue from any other supply drawer.	1. Try a new film cartridge. 2. If the error persists, call an Authorized Service Provider of Kodak products.

Number	Message Display	Message Details	Operator Action
23-175	Rollback Failed to Engage Cartridge	Jobs will continue to be queued. Printing will continue from any other supply drawer.	1. Try a new film cartridge. 2. If the error persists, call an Authorized Service Provider of Kodak products.
23-176	Film Cartridge Failed to Open	Jobs will continue to be queued. Printing will continue from any other supply drawer.	1. Try a new film cartridge. 2. If the error persists, call an Authorized Service Provider of Kodak products.
23-177	Film Cartridge Failed to Close	Jobs will continue to be queued. Printing will continue from any other supply drawer.	1. Open the drawer. 2. Close the cartridge to prevent film from fogging. 3. Close the drawer. 4. If the error persists, call an Authorized Service Provider of Kodak products.
23-178	Film Cartridge Failed to Open	Jobs will continue to be queued. Printing will continue from any other supply drawer.	1. Try a new film cartridge. 2. If the error persists, call an Authorized Service Provider of Kodak products.
23-179	Film Cartridge Failed to Close	Jobs will continue to be queued. Printing will continue from any other supply drawer.	1. Open the drawer. 2. Close the cartridge to prevent film from fogging. 3. Close the drawer. 4. If the error persists, call an Authorized Service Provider of Kodak products.
23-624	Calibration Failed: Film Density Readings not Monotonic	Jobs will continue to be queued. Printing will continue from any other supply drawer.	1. Try a new film cartridge. 2. If the error persists, call an Authorized Service Provider of Kodak products.

Number	Message Display	Message Details	Operator Action
23-631	Calibration Failed: Film Dmin Outside Target	Jobs will continue to be queued. Printing will continue from any other supply drawer.	1. Try a new film cartridge. 2. If the error persists, disable AIQC for this film cartridge.
23-632	Calibration Failed: Film Dmax Outside Target	Jobs will continue to be queued. Printing will continue from any other supply drawer.	1. Try a new film cartridge. 2. If the error persists, disable AIQC for this film cartridge.
24-931	Internal Communications Failure: Film Cartridge Controller	Jobs will continue to be queued. Film affected by the error will be reprinted.	1. Restart the laser imager. 2. If the error persists, call an Authorized Service Provider of Kodak products.
24-154	Internal Communications Failure: Film Cartridge Controller	Jobs will continue to be queued. Film affected by the error will be reprinted.	1. Restart the laser imager. 2. If the error persists, call an Authorized Service Provider of Kodak products.
25-154	Internal Communications Failure: RF Tag	Jobs will continue to be queued. Film affected by the error will be reprinted.	1. Restart the laser imager. 2. If the error persists, call an Authorized Service Provider of Kodak products.
25-922	Internal Diagnostic Failure: RF Tag	Jobs will continue to be queued. Film affected by the error will be reprinted.	1. Restart the laser imager. 2. If the error persists, call an Authorized Service Provider of Kodak products.
25-931	Internal Communications Failure: RF Tag	Jobs will continue to be queued. Film affected by the error will be reprinted.	1. Restart the laser imager. 2. If the error persists, call an Authorized Service Provider of Kodak products.
26-164	Film Jam in Area 2: Platen	Jobs will continue to be queued. Film affected by the error will be reprinted.	1. Open the front door. 2. Remove any film. 3. Close the door.

Number	Message Display	Message Details	Operator Action
26-165	Film Jam in Area 3: Transport	Jobs will continue to be queued. Film affected by the error will be reprinted.	1. Open the front door. 2. Remove any film. 3. Close the door.
26-166	Film Jam in Area 2: Transport	Jobs will continue to be queued. Film affected by the error will be reprinted.	1. Open the front door. 2. Remove any film from the vertical transport, film cartridge, or film platen. 3. Close the door.
26-167	Film Jam in Area 2: Transport	Jobs will continue to be queued. Film affected by the error will be reprinted.	1. Open the front door. 2. Remove any film. 3. Close the door.
26-169	Film Jam in Area 3: Platen	Jobs will continue to be queued. Film affected by the error will be reprinted.	1. Open the front door. 2. Remove any film. 3. Close the door.
26-542	Film Jam in Area 4: Processor	Jobs will continue to be queued. Film affected by the error will be reprinted.	1. Open the hood. 2. Remove any film. 3. Close the hood.
26-543	Film Jam in Area 5: Processor	Jobs will continue to be queued. Film affected by the error will be reprinted.	1. Open the hood. 2. Remove any film. 3. Close the hood.
26-544	Film Jam in Area 5: Densitometer	Jobs will continue to be queued. Film affected by the error will be reprinted.	1. Open the hood. 2. Remove any film. 3. Close the hood.
26-545	Film Jam in Area 5: Sorter	Jobs will continue to be queued. Film affected by the error will be reprinted.	1. Open the hood. 2. Remove any film. 3. Close the hood.
26-546	Film Jam in Area 6: Sorter	Jobs will continue to be queued. Film affected by the error will be reprinted.	1. Open the hood. 2. Remove any film. 3. Close the hood.
27-121	Internal Hardware Failure: Optics	Jobs will continue to be queued. Film affected by the error will be reprinted.	1. Restart the laser imager. 2. If the error persists, call an Authorized Service Provider of Kodak products.

Number	Message Display	Message Details	Operator Action
27-123	Internal Hardware Failure: Optics	Jobs will continue to be queued. Film affected by the error will be reprinted.	1. Restart the laser imager. 2. If the error persists, call an Authorized Service Provider of Kodak products.
27-124	Internal Hardware Failure: Platen	Jobs will continue to be queued. Film affected by the error will be reprinted.	1. Restart the laser imager. 2. If the error persists, call an Authorized Service Provider of Kodak products.
27-127	Internal Hardware Failure: Platen	Jobs will continue to be queued. Film affected by the error will be reprinted.	1. Restart the laser imager. 2. If the error persists, call an Authorized Service Provider of Kodak products.
27-128	Internal Hardware Failure: Platen	Jobs will continue to be queued. Film affected by the error will be reprinted.	1. Restart the laser imager. 2. If the error persists, call an Authorized Service Provider of Kodak products.
27-154	Internal Communications Failure: Optics	Jobs will continue to be queued. Film affected by the error will be reprinted.	1. Restart the laser imager. 2. If the error persists, call an Authorized Service Provider of Kodak products.
27-601	Calibration Failed: Optics	Jobs will continue to be queued. Film affected by the error will be reprinted.	1. Restart the laser imager. 2. If the error persists, call an Authorized Service Provider of Kodak products.
27-602	Calibration Failed: Optics	Jobs will continue to be queued. Film affected by the error will be reprinted.	1. Restart the laser imager. 2. If the error persists, call an Authorized Service Provider of Kodak products.
27-603	Calibration Failed: Optics	Jobs will continue to be queued. Film affected by the error will be reprinted.	1. Restart the laser imager. 2. If the error persists, call an Authorized Service Provider of Kodak products.

Number	Message Display	Message Details	Operator Action
27-604	Calibration Failed: Optics	Jobs will continue to be queued. Film affected by the error will be reprinted.	1. Restart the laser imager. 2. If the error persists, call an Authorized Service Provider of Kodak products.
27-605	Calibration Failed: Optics	Jobs will continue to be queued. Film affected by the error will be reprinted.	1. Restart the laser imager. 2. If the error persists, call an Authorized Service Provider of Kodak products.
27-606	Calibration Failed: Optics	Jobs will continue to be queued. Film affected by the error will be reprinted.	1. Restart the laser imager. 2. If the error persists, call an Authorized Service Provider of Kodak products.
27-607	Calibration Failed: Optics	Jobs will continue to be queued. Film affected by the error will be reprinted.	1. Restart the laser imager. 2. If the error persists, call an Authorized Service Provider of Kodak products.
27-611	Internal Hardware Failure: Optics	Jobs will continue to be queued. Film affected by the error will be reprinted.	1. Restart the laser imager. 2. If the error persists, call an Authorized Service Provider of Kodak products.
27-640	Internal Hardware Failure: Optics	Jobs will continue to be queued. Film affected by the error will be reprinted.	1. Restart the laser imager. 2. If the error persists, call an Authorized Service Provider of Kodak products.
27-641	Internal Diagnostic Failure: Optics	Jobs will continue to be queued. Film affected by the error will be reprinted.	1. Restart the laser imager. 2. If the error persists, call an Authorized Service Provider of Kodak products.
27-642	Internal Hardware Failure: Optics	Jobs will continue to be queued. Film affected by the error will be reprinted.	1. Restart the laser imager. 2. If the error persists, call an Authorized Service Provider of Kodak products.

Number	Message Display	Message Details	Operator Action
27-643	Internal Diagnostic Failure: Optics	Jobs will continue to be queued. Film affected by the error will be reprinted.	1. Restart the laser imager. 2. If the error persists, call an Authorized Service Provider of Kodak products.
27-644	Internal Communications Failure: Optics	Jobs will continue to be queued. Film affected by the error will be reprinted.	1. Restart the laser imager. 2. If the error persists, call an Authorized Service Provider of Kodak products.
27-645	Internal Hardware Failure: Optics	Jobs will continue to be queued. Film affected by the error will be reprinted.	1. Restart the laser imager. 2. If the error persists, call an Authorized Service Provider of Kodak products.
27-646	Internal Hardware Failure: Optics	Jobs will continue to be queued. Film affected by the error will be reprinted.	1. Restart the laser imager. 2. If the error persists, call an Authorized Service Provider of Kodak products.
27-914	Internal Image Transfer Failure: Optics	Jobs will continue to be queued. Film affected by the error will be reprinted.	1. Restart the laser imager. 2. If the error persists, call an Authorized Service Provider of Kodak products.
27-915	Internal Image Transfer Failure: Optics	Jobs will continue to be queued. Film affected by the error will be reprinted.	1. Restart the laser imager. 2. If the error persists, call an Authorized Service Provider of Kodak products.
27-916	Internal Diagnostic Failure: Optics	Jobs will continue to be queued. Film affected by the error will be reprinted.	1. Restart the laser imager. 2. If the error persists, call an Authorized Service Provider of Kodak products.
27-931	Internal Communications Failure: Optics	Jobs will continue to be queued. Film affected by the error will be reprinted.	1. Restart the laser imager. 2. If the error persists, call an Authorized Service Provider of Kodak products.

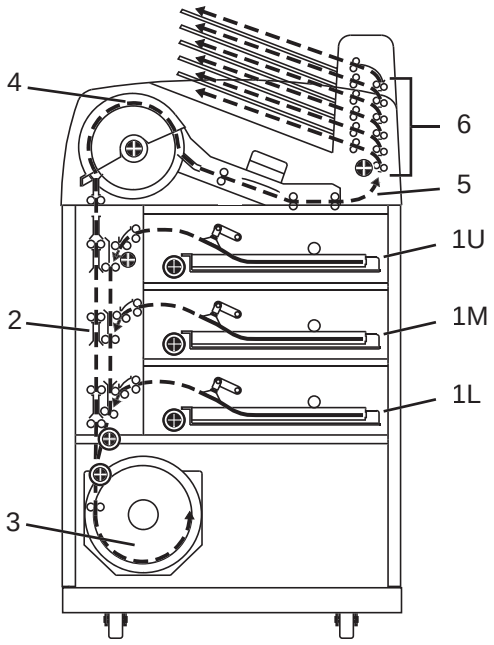
Number	Message Display	Message Details	Operator Action
28-154	Internal Communications Failure: Processor	Jobs will continue to be queued. Film affected by the error will be reprinted.	1. Restart the laser imager. 2. If the error persists, call an Authorized Service Provider of Kodak products.
28-155	Internal Communications Failure: Processor	Jobs will continue to be queued. Film affected by the error will be reprinted.	1. Restart the laser imager. 2. If the error persists, call an Authorized Service Provider of Kodak products.
28-501	Internal Hardware Failure: Processor	Jobs will continue to be queued. Film affected by the error will be reprinted.	1. Restart the laser imager. 2. If the error persists, call an Authorized Service Provider of Kodak products.
28-506	Internal Communications Failure: Processor	Jobs will continue to be queued. Film affected by the error will be reprinted.	1. Restart the laser imager. 2. If the error persists, call an Authorized Service Provider of Kodak products.
28-509	Processor Warm-up Failure	Jobs will continue to be queued. Film affected by the error will be reprinted.	1. Restart the laser imager. 2. If the error persists, call an Authorized Service Provider of Kodak products.
28-551	Processor Heater Failure	Jobs will continue to be queued. Film affected by the error will be reprinted.	1. Restart the laser imager. 2. If the error persists, call an Authorized Service Provider of Kodak products.
28-554	Processor Over Temperature	Jobs will continue to be queued. Film affected by the error will be reprinted.	1. Restart the laser imager. 2. If the error persists, call an Authorized Service Provider of Kodak products.
28-931	Internal Communications Failure: Processor	Jobs will continue to be queued. Film affected by the error will be reprinted.	1. Restart the laser imager. 2. If the error persists, call an Authorized Service Provider of Kodak products.

Number	Message Display	Message Details	Operator Action
29-154	Internal Communications Failure: Densitometer	Jobs will continue to be queued. Film affected by the error will be reprinted.	1. Restart the laser imager. 2. If the error persists, call an Authorized Service Provider of Kodak products.
29-924	Internal Diagnostic Failure: Densitometer	Jobs will continue to be queued. Film affected by the error will be reprinted.	1. Restart the laser imager. 2. If the error persists, call an Authorized Service Provider of Kodak products.
29-925	Internal Diagnostic Failure: Densitometer	Jobs will continue to be queued. Film affected by the error will be reprinted.	1. Restart the laser imager. 2. If the error persists, call an Authorized Service Provider of Kodak products.
29-926	Internal Diagnostic Failure: Densitometer	Jobs will continue to be queued. Film affected by the error will be reprinted.	1. Restart the laser imager. 2. If the error persists, call an Authorized Service Provider of Kodak products.
29-927	Internal Diagnostic Failure: Densitometer	Jobs will continue to be queued. Film affected by the error will be reprinted.	1. Restart the laser imager. 2. If the error persists, call an Authorized Service Provider of Kodak products.
29-931	Internal Communications Failure: Densitometer	Jobs will continue to be queued. Film affected by the error will be reprinted.	1. Restart the laser imager. 2. If the error persists, call an Authorized Service Provider of Kodak products.
30-154	Internal Communications Failure: Sorter	Jobs will continue to be printed. All films are sent to sorter bin 1.	1. Restart the laser imager. 2. If the error persists, call an Authorized Service Provider of Kodak products.
30-930	Internal Hardware Failure: Sorter	Jobs will continue to be printed. All films are sent to sorter bin 1.	1. Restart the laser imager. 2. If the error persists, call an Authorized Service Provider of Kodak products.

Number	Message Display	Message Details	Operator Action
30-931	Internal Communications Failure: Sorter	Jobs will continue to be printed. All films are sent to sorter bin 1.	1. Restart the laser imager. 2. If the error persists, call an Authorized Service Provider of Kodak products.
31-931	Internal Communications Failure: FPGA	Jobs will continue to be queued, but new film will not be initiated.	1. Restart the laser imager. 2. If the error persists, call an Authorized Service Provider of Kodak products.

Clearing Film Jams

The numbers in the illustration identify key areas on the path from film pickup to exposure, through development and onto the film sorter.



Jam Areas

1 Film pickup from the film cartridge.

2 Vertical film path between the film pickup area and the film platen and between the film platen and the processor drum.

3 Film platen.

4 Film processor drum.

5 Film feed through the densitometer and onto the sorter.

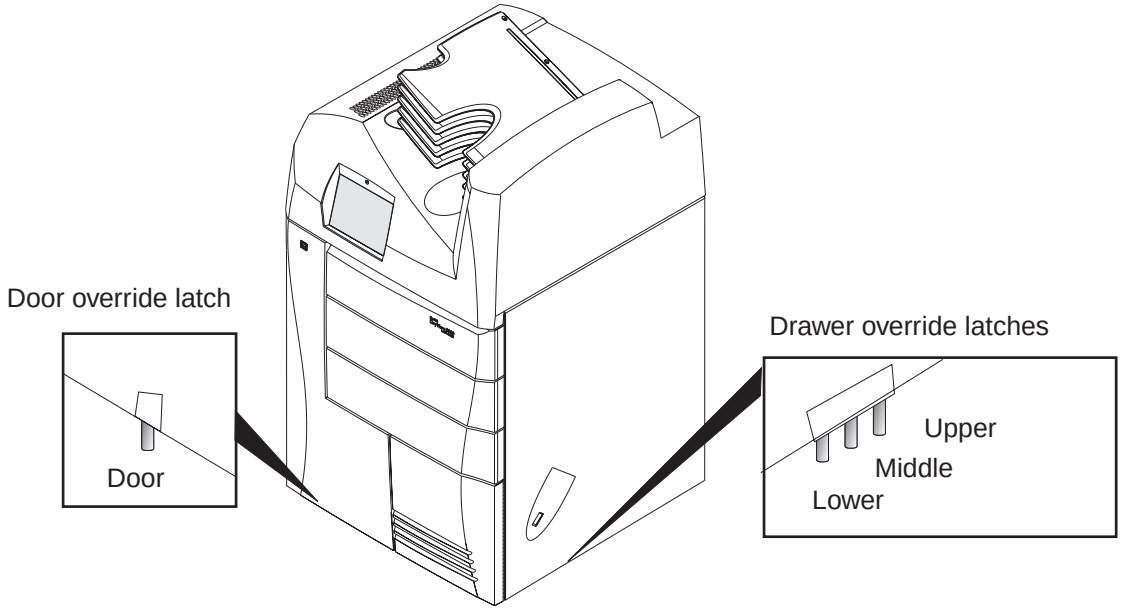
6 Film feed within the sorter.

Film Drawers and Door Override Latches

If the laser imager is powered down or if the **Door Control** screen fails to open the drawers or door, use the manual override latches.

The door override latch is under the front of the laser imager. The drawer override latches are under the right side of the laser imager.

NOTE: If the drawers are opened without the film cartridge closed, several sheets of film at the top of the film cartridge will be exposed (fogged) and should be discarded.



Override Latches

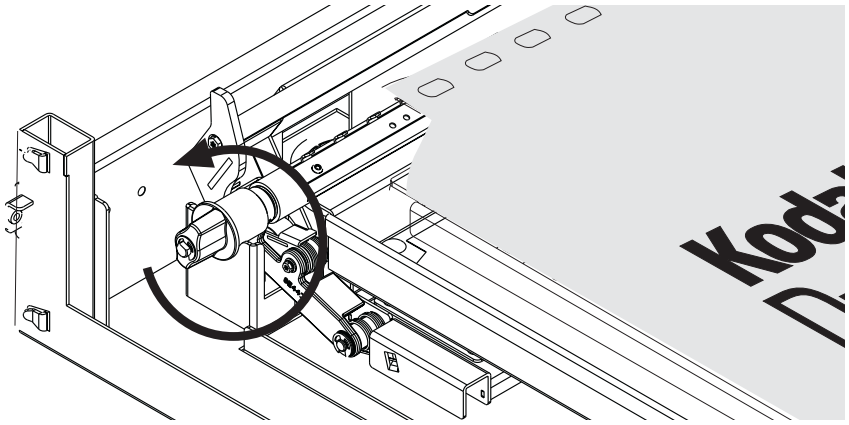
To manually open the drawers and front door:

1. Minimize film exposure by making the room as dark as possible.
2. Lift the desired override latch.
3. If necessary, manually close the film cartridge to prevent the film from fogging.

Manually Closing the Film Cartridge Lid

Film cartridges must be closed manually if the drawers are opened without the film cartridge closing automatically.

NOTE: If the drawers are opened without the film cartridge closed, several sheets of film at the top of the film cartridge will be exposed (fogged) and should be discarded. Before opening the drawer, make the room as dark as possible to minimize exposure.



Film Cartridge Rollback Knob

To manually close the film cartridge:

1. Lift the desired drawer override latch.
2. Pull the film drawer out to its furthest extension.
3. Turn the rollback knob counterclockwise until the film cartridge lid is closed. Continue turning the rollback knob until the knob cannot be rotated further.

Clearing Film Jams from Area 1

The area where the film is removed from the film cartridge and positioned to the drive rollers is Area 1. If the laser imager cannot properly pick up a sheet of film and position the film to the drive, an error message appears on the local panel.

NOTE: When problems occur in Area 1, the film cartridge remains open. When you open the drawer, the top sheets of film in the film cartridge will be exposed (fogged). Before opening the drawer, make the room as dark as possible to minimize exposure. Discard any fogged film.

When the Film Jam in Area 1: error message appears:

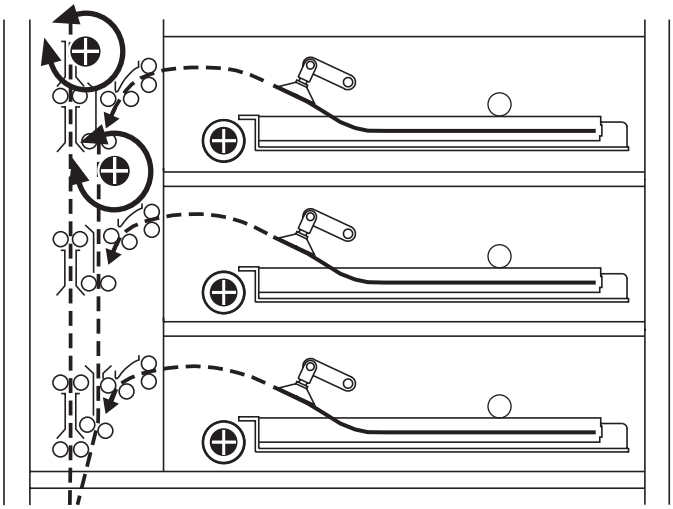
1. Touch the **Show Jam** button. The **Door Control** screen appears and the affected drawer is highlighted.
2. Touch the affected drawer icon. The drawer opens.
3. Pull the drawer out to its furthest extension.
4. Remove any film outside the cartridge box and then turn the rollback

knob counterclockwise to manually close the cartridge lid (see "Manually Closing the Film Cartridge Lid" on page 5-23).

5. Close the drawer.
6. If you cannot resolve the problem, call an Authorized Service Provider of Kodak products.

Clearing Film Jams from Area 2

The vertical transport between the film pickup area and the film platen, and between the film platen and the processor drum is Area 2. If film jams in this area, an error message appears on the local panel.



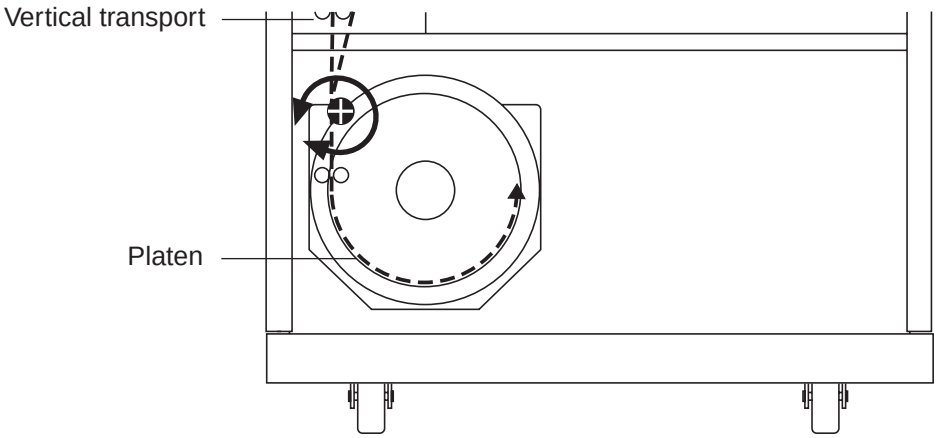
Vertical Transport Rollback Knobs

When the Film Jam in Area 2: error message appears:

1. Touch the **Show Jam** button. The **Door Control** screen appears and the affected area is highlighted.
2. Touch the front door icon. The front door opens.
3. Locate the jammed film in the vertical transport.
4. Remove the jammed film. If the film is jammed in one of the feed roller sets, turn the rollback knob in the appropriate direction to free the film.
5. Close the front door.
6. If you cannot clear the jammed film, call an Authorized Service Provider of Kodak products.

Clearing Film Jams from Area 3

The film platen is Area 3. If film jams in this area, an error message appears on the local panel.



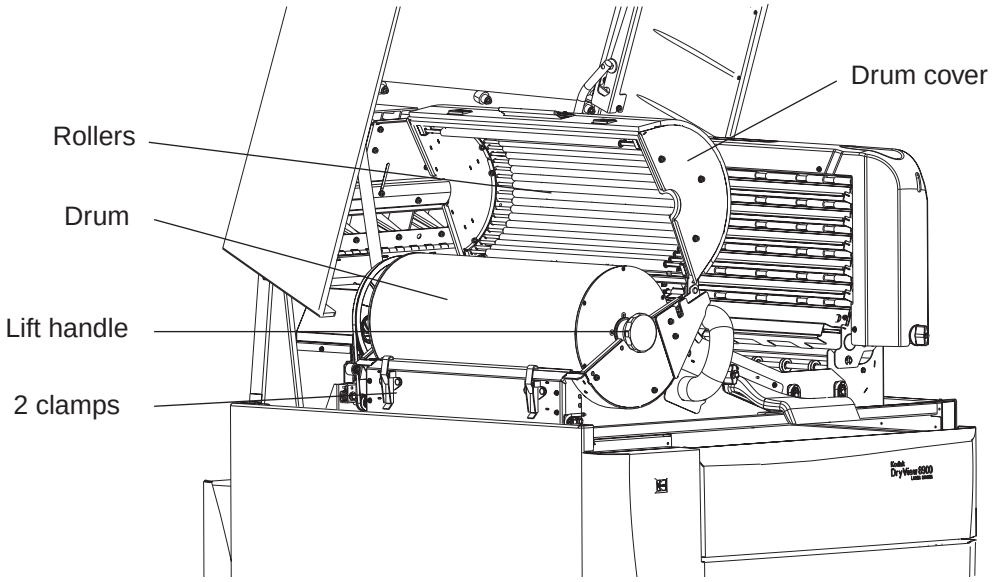
Clearing Film Jam Area 3

When the Film Jam in Area 3: error message appears:

1. Touch the **Show Jam** button. The **Door Control** screen appears and the affected area is highlighted.
2. Touch the front door icon. The front door opens.
3. Locate the jammed film in the platen or vertical transport.
4. Remove the jammed film. If the film is jammed in one of the feed roller sets, turn the rollback knob in the appropriate direction to free the film.
5. Close the front door.
6. If you cannot clear the jammed film, call an Authorized Service Provider of Kodak products.

Clearing Film Jams from Area 4

The film processor drum is Area 4. If film jams in this area, an error message appears on the local panel.



Clearing Film Jam Area 4

When the Film Jam in Area 4: error message appears:

1. Touch the **Show Jam** button. The **Door Control** screen appears and the affected area is highlighted.
2. Open the hood to its first locking position.

CAUTION:
Hot surface. Drum and rollers inside the processor are hot. Exercise caution when removing jammed film from the processor.

3. Release the two clamps at the left of the processor.

CAUTION:
Whenever you raise or lower the drum cover, grasp the cover only on the lift handle to avoid the possibility of pinching your fingers.

4. Open the drum cover.

CAUTION:
To prevent damage to the surface of the processor drum, do not use any type of tool to remove jammed film.

5. Clear the jammed film from the processor area. There may be more than one sheet.

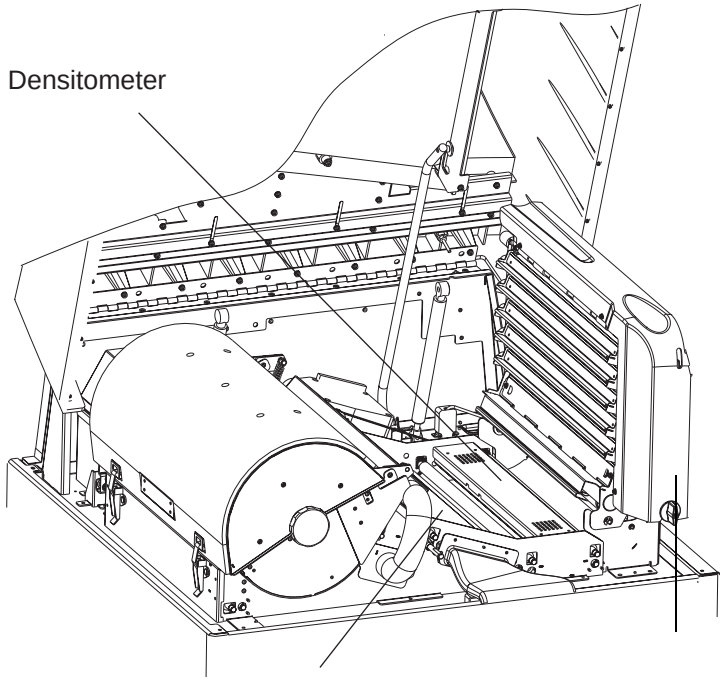
NOTE: If the film is jammed in the lower section of Area 4, open the front door to remove the film (see "Clearing Film Jams from Area 2" on page 5-24).

6. Close the drum cover and secure the drum cover with the 2 clamps.
7. Close the hood.
8. If you cannot clear the jammed film, call an Authorized Service Provider of Kodak products.

NOTE: The processor has to warm up to operating temperature before the processor can print.

Clearing Film Jams from Area 5

The drive rollers prior to the sorter are Area 5. If film jams in this area, an error message appears on the local panel.



Clearing Film Jam 5

When the Film Jam in Area 5: error message appears:

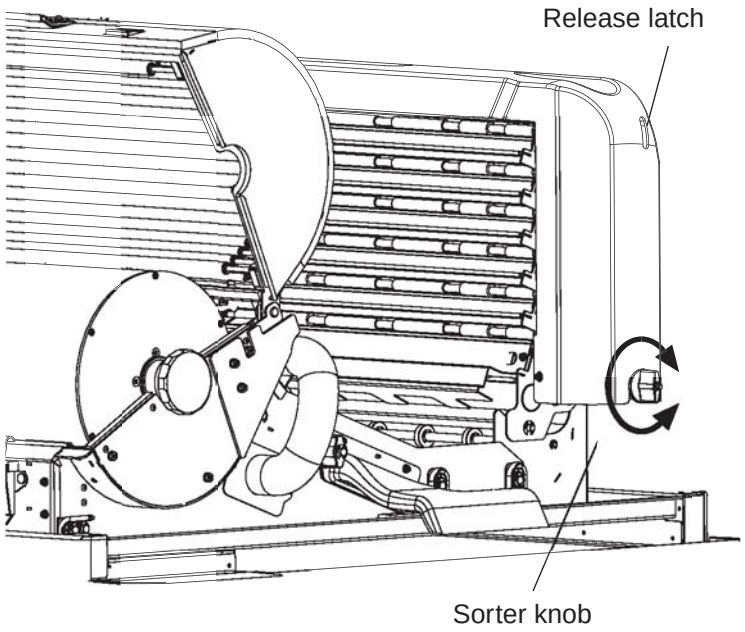
1. Touch the **Show Jam** button. The **Door Control** screen appears and the affected area is highlighted.
2. Open the hood to its first locking position.

CAUTION:
Hot surface. Drum and rollers inside the processor are hot. Exercise caution when removing jammed film from the processor.

3. Remove the jammed film in the film path from the processor to the sorter.
4. Close the hood.
5. If you cannot clear the jammed film, call an Authorized Service Provider of Kodak products.

Clearing Film Jams from Area 6

The sorter is Area 6. If film jams in this area, an error message appears on the local panel.



Sorter Knob

When the Film Jam in Area 6: error message appears:

1. Touch the **Show Jam** button. The **Door Control** screen appears and the affected area is highlighted.
2. Open the hood to its first locking position.

CAUTION:
Hot surface. Drum and rollers inside the processor are hot. Exercise caution when working in the drum area.

3. Inspect the sorter rollers on the left side of the sorter. Remove any film. If the film is jammed in one of the feed roller sets, turn the sorter knob in the appropriate direction to free the film.
4. To access the inside area of the sorter:
   a. Press down on the release latch.
   b. Carefully tilt the sorter to the left until the sorter is in a resting position.
5. Remove any film. If the film is jammed in one of the feed roller sets, turn the sorter knob in the appropriate direction to free the film.
6. Carefully tilt the sorter back to its locked position.
7. Close the hood.

8. If you cannot clear the jammed film, call an Authorized Service Provider of Kodak products.

6 Support Information

Calling for Support

If you cannot repair the *Kodak DryView* 8900 Laser Imager and need help, you should call an Authorized Service Provider of Kodak Products. As a rule, you should not spend more than 30 minutes diagnosing a down machine.

Before you call, have the following information available:

- Model number: 8900
- K-number: (see the front of the laser imager above the Kodak logo)
- Phone Support number: 1-800-328-2910 (U.S. only)

Ordering Supplies

Necessary tools, parts, and materials are listed in "Necessary Materials" on page 3-1. To order parts and materials, call: 1-800-328-2910. Have the following information available:

- Purchase order
- Part numbers

Appendix A: Quality Control Procedures

Compliance Guide - Quality Control for Laser Imagers Used in Digital Mammography Systems

These Quality Control Procedures are intended to provide guidance for mammography facilities and their personnel. They represent the equipment manufacturer's views on the appropriate procedures for conducting Quality Control tests for digital mammography and observing the Mammography Quality Standards Act (MQSA). The following procedures represent acceptable ways of doing the tests, but unlike regulations, they are not binding. Alternate procedures may be used if they satisfy the requirements of the applicable statute, regulations, or both. It is the responsibility of the mammography facility to read, understand, and follow the regulations.

Under its own authority, a state may impose requirements more stringent than those imposed in the FDA Mammography Quality Standards Act. A facility should check with state or local authorities regarding their requirements.

Automatic Image Quality Control and the QC Process

The *Kodak DryView* 8900 Laser Imager has a built-in Automatic Image Quality Control (AIQC) system that automatically compensates for film lot variations, ensuring consistent print densities. The MQSA requires that the mammography facility establish a quality control (QC) process that verifies the effectiveness of the AIQC system. Kodak's recommendations are based on the MQSA and the QC process described in the Radiologic Technologist's Section of the Mammography Quality Control Manual, 1999, published by the American College of Radiology. This QC process has been adapted to apply to the special features of *Kodak DryView* Mammography Laser Imaging Film and the characteristics of the laser imager. The procedures that follow assume that the user has been trained in operation of the laser imager.

Running a QC Baseline Test

Per the MQSA, a baseline test must be run when the laser imager is first installed and must be repeated every time a box of film with a different emulsion number is used. This test sets up a baseline set of film parameter values that shall be used as a standard for comparison in daily QC tests. Kodak recommends the procedure described below as a means of complying with this regulation.

Procedure for the Installing Field Engineer

The installing field engineer verifies that the laser imager meets its performance specifications, runs the baseline test described below, and prints a clinical image of the site's choice. The site's responsible healthcare professional is asked to approve that the laser imager produces an acceptable clinical image. If the image is not acceptable, the field engineer repeats the procedures until the settings for the baseline print produce acceptable clinical images.

Procedure for the QC Technologist

After an acceptable installation, the user facility's technologist must repeat the baseline test whenever a change occurs in a film lot number.

NOTE: The following is an example of a film lot number: 020662-0211-A-019. The film emulsion number is underlined.

Baseline Test

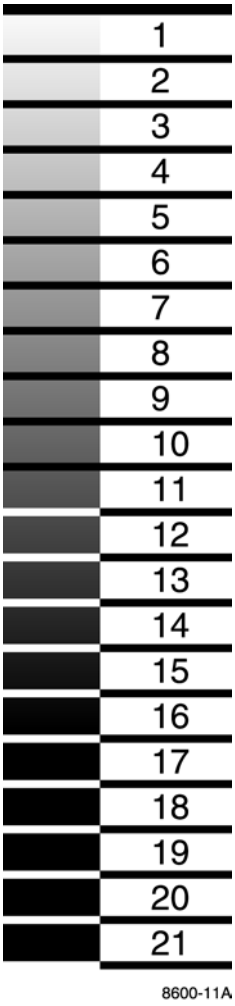
1. Apply power to the laser imager and allow it to warm to "READY", as indicated on the local panel. Request a Calibration Test Print to put the AIQC system in control.
2. Print two QC Step Wedge test films. See the figure on the next page for a sample step wedge.
3. Using a densitometer, read and record the density of each step (1 through 21) on each of the two test films. (For consistency from film to film, always read density at the center of each wedge.) The QC Step Wedge is positioned on the film to allow for the use of an automatic densitometer such as the *X-Rite* Model 391 densitometer for automatic density recordings.

NOTE: You can choose to use a clear area on the test films instead of the actual step 1 to take the “step 1” density reading.

4. Determine and record the average of the two densities read for each step.
5. Select from the average values calculated from the 21 steps to determine the film parameter values as follows:
   a. Determine which step has a density closest to 2.20. Then determine which step has a density closest to but not less than 0.45. Designate the difference between these densities as Density Difference (DD).
   b. Determine which step has an average density closest to but not less than 1.20. Designate this step as Medium Density (MD).

c. Designate the average for Step 1 (or the clear area on the film) as Base Plus Fog.

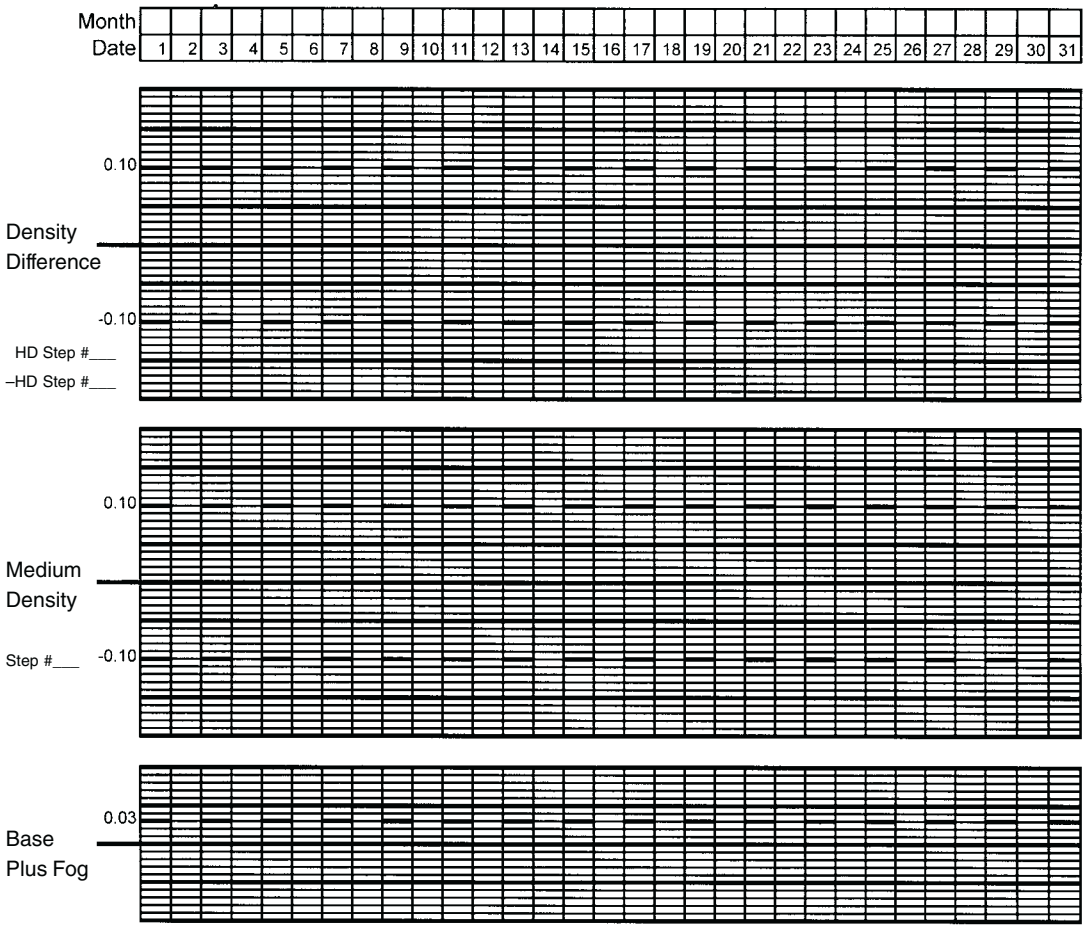
d. Record the numeric values of DD, MD and Base Plus Fog on the center lines of the laser imager Quality Control Chart. See the Quality Control Chart on the next page. Record also the step numbers involved.



QC Step Wedge

LASER IMAGER QUALITY CONTROL CHART

Imager Serial:_____ Emulsion: _____ Month:_____ Year:_____



Remarks	Date	Action

Running a Daily QC Test

The MQSA requires that a sensitometric test be run daily and that clinical images be made only when the chart is within the control ranges. Kodak recommends the following laser imager test. Perform this test daily before clinical mammograms are performed, to ensure quality output. Plot the values obtained from the test on the chart for comparison with the film parameter values established in the baseline test.

1. Apply power to the laser imager and allow it to warm to "READY", as indicated on the local panel. Request a Calibration Test Print to put the AIQC system in control.
2. Print a QC Step Wedge film.
3. Use a densitometer to read the designated steps on the test film. Read at the center of each step. If a clear area on the film was used instead of step 1 in the baseline tests (see "Baseline Test" on page A-2), use a clear area in this test.
4. Record the date on the chart. Then plot the DD, MD, and Base Plus Fog values in the appropriate column on the chart.
5. Determine if any of the values exceeds the control limits for the parameter.

NOTE: The numbers above and below the center lines on the chart indicate the control limits. For example, for DD or MD, 0.10 above or below the center line is approaching the limit, but is acceptable. However, 0.15 above or below the line is not acceptable.

6. If the values did not exceed a control limit, examine the chart and see if there is a trend that suggests possible future problems. (This could be, for example, three or more data points for DD, MD or Base Plus Fog in succession moving upward or downward.) If the data points have not exceeded the limits, clinical mammograms can continue to be run.
7. If any value exceeds a control limit, DO NOT run clinical mammograms until the problem is corrected. Proceed as follows:
   a. Circle the out of control point(s) on the chart.
   b. Correct the problem. The fault could be in the film, imager or densitometer, or in the performance of the QC procedure.
   c. Note the cause of the problem in the "Remarks" section of the chart.
   d. Repeat the step wedge test and graph the parameters on the chart.

Glossary

AIQC	Automatic Image Quality Control.
CR	Computed Radiography, the process of creating digital radiographic images.
CT	Computed Tomography, the process of creating digital tomographic images.
DICOM	Digital Imaging and Communications in Medicine. A TCP/IP-based protocol for transmitting and receiving medical imaging and related data over a network.
Dmax	Dmax means maximum density. Dmax is the density of an area on the film that has received maximum exposure.
Dmin	Dmin means minimum density. Dmin is the density of an unexposed area on the film.
dPatch	dPatch means density patch. This is a small patch of specified density in the trailing edge of each film that AIQC uses to monitor density change on film. The dPatch is only available as an option on 35 x 43 cm (14 x 17 in.) film.
DR	Digital radiography, the process of creating digital radiographic images.
DRE	DICOM rastor engine.
DSA	Digital Subtraction Angiography.
FAZ	Fatty acids (FAZ). A by-product from the processing of *Kodak DryView* Laser Imaging Film. As film is processed (heated), solvents in the film emulsion are let go as a gas. Some of these gases condense into FAZ.
GSM	Gray Scale Manager.
Film model	The film model defines the print characteristics for a particular lot of film.
Key operator	The person(s) designated by the department manager to receive applications training and allowed access to password-protected areas to make system changes.
LED	Light Emitting Diode.
MCS	Machine Control System. A microprocessor system on a printed circuit board that runs code to control the subsystems with the laser imager.
Modality	Medical equipment that actually generates medical images (for example, an MRI).

Monotonic	Continuously increasing. When a calibration sheet, which consists of strips of increasing density (Dmin) to maximum density (Dmax), is read by the densitometer, the density values must be monotonic (continuously increasing). If they are not, an error message is generated.
MR	Magnetic Resonance.
PACS Link (MIM)	Picture Archiving Communication System Link - Medical Image Manager. A family of store-and-forward software applications that is developed by Kodak.
Platen	The metal surface on which the film rests as it is exposed.
QC step wedge	Mammography Quality Control Test Pattern.
RF Tag	Radio frequency tag.
Service image	An image used by service personnel for troubleshooting.
Shutdown	The process of exiting current tasks and applications and turning the power off.
SMPTE test pattern	A Society of Motion Picture and Television Engineering monitor test pattern that is used for analyzing image-quality problems.
Test type	The type of test film that will be printed. Two film test types are available: a density test film (SMPTE pattern) and a calibration film.
TFT	Transfer Function Tables.
Undelivered queue	The queue of jobs that cannot be printed because of problems with the job description.
Version	A different rendition of an image. A second version of an image is processed using a second set of image processing parameters.

Index

A

AIQC, 2-3, A-1, G-1
assembling new charcoal filters, 3-28
assembling the processor, 3-27
automatic image quality control. See AIQC

B

base plus fog, A-3
baseline test, A-2

C

calling for support, 6-1
cartridge lid, manually closing, 5-23
checking the operation, 3-33
cleaning the carriage rails, 3-7
cleaning the charcoal filter housing, upper plenum, and duct, 3-29
cleaning the cooling section, 3-25
cleaning the diverter and installing a new felt pad assembly, 3-19
cleaning the drum, 3-17
cleaning the drum cover, 3-13
cleaning the encoder scales, 3-8
cleaning the FAZ hoses, 3-26
cleaning the FAZ traps and drum duct, 3-10
cleaning the film platen, 3-9
cleaning the filtration gaskets and back door seals, 3-31
cleaning the lower cover and entrance guide, 3-18
cleaning the pressure rollers and applying lubricant, 3-15
clearing film jams, 5-21

D

daily QC test, A-5
densitometer, 2-3
density difference (DD), A-2
DICOM, 2-1
Dmax, G-1
Dmin, G-1
door override latches, 5-22
dPatch, G-1
drawers, 2-2, 2-7
DryView 8900 description
- AIQC, 2-3
- densitometer, 2-3
- film drawers, 2-2
- film platen, 2-2
- film processor, 2-3
- film sorter, 2-3
- film transport, 2-2
- how it works, 2-4
- local panel, 2-2
- optics module, 2-3
- site checklist, 2-14
- site specifications, 2-10
- specifications, 2-5

E

emergency maintenance, 3-4
environment requirements
- heat dissipation, 2-13
- operating environment, 2-13
- storage environment, 2-13

environmental requirements, 2-13

F

FAZ, G-1
FAZ trap
- lower, 4-4
- upper, 4-3

film
- cartridge, manually closing, 5-23
- drawers, 2-2, 2-7
- jam areas, 5-21
- jams, 5-21
  - area 1, 5-23
  - area 2, 5-24
  - area 3, 5-25
  - area 4, 5-26

area 5, 5-28
area 6, 5-29
model, G-1
pickup problems, 5-23
sizes, 2-1
film drawer override latches, 5-22
film platen, 2-2
film processor, 2-3
film sorter, 2-3
film transport, 2-2
floor
levelness, 2-11
load, 2-11
vibration, 2-7

G

glossary, G-1

H

heat dissipation, 2-13
heat output, 2-6

I

image orientation, 2-8
image size, 2-8
imaging assembly, 4-1
input power, 2-6
installing a new air filter, 3-32
installing a new diverter and felt pad assembly, 3-21
installing new cover gaskets on the drum cover, 3-14
installing new drum exit transport rollers, 3-23

K

key operator, G-1

L

laser, 2-6
local panel, 2-2
lower FAZ trap, 4-4

M

maintenance plan, 3-3
maintenance procedures
assembling the processor, 3-27
checking the operation, 3-33
cleaning the carriage rails, 3-7
cleaning the charcoal filter housing, upper plenum, and duct, 3-29
cleaning the cooling section, 3-25
cleaning the diverter and installing a new felt pad assembly, 3-19
cleaning the drum, 3-17
cleaning the drum cover, 3-13
cleaning the encoder scales, 3-8
cleaning the FAZ hoses, 3-26
cleaning the FAZ traps and drum duct, 3-9
cleaning the film platen, 3-9
cleaning the film platen and spinner motor, 3-9
cleaning the filtration gaskets and back door seals, 3-31
cleaning the lower cover and entrance guide, 3-17
cleaning the pressure rollers and applying lubricant, 3-15
installing a new air filter, 3-32
installing new charcoal filters, 3-28
installing new cover gaskets on the drum cover, 3-13
installing new drum exit transport rollers, 3-23
preparing for preventive maintenance, 3-6
resetting the PM count and service history, 3-33
mammography quality standards act (MQSA), A-1
medium density (MD), A-2
messages
error, 5-3
status, 5-1
monotonic, G-2

N

necessary materials, 3-1
network addresses, 2-12
network drop, 2-12
noise, acoustic, 2-7

O

operating environment, 2-13
operator actions, 5-3
optics module, 2-3
ordering supplies, 6-1
override latches
  door, 5-22
  drawer, 5-22
overview, laser imager, 2-1

P

PACS Link, G-2
platen, G-2
platen, film, 2-2
power
  consumption, 2-6
  input, 2-6
  requirements, 2-12
  supply, 2-6
power requirements, 2-12
power supply, 2-6
pre-installation tasks, 2-14
preparing for preventive maintenance, 3-6
preventive maintenance
  icon, 5-3
  maintenance plan, 3-3
  maintenance procedures, 3-5
  necessary materials, 3-1
processor drum, 4-5
processor, film, 2-3

Q

QC process, A-1
QC step wedge, A-3, G-2
quality control (QC)
  baseline test, A-2
  daily QC test, A-5
  field engineer, A-2
  process, A-1
  technologist, A-2
quality control compliance guide, A-1

R

replacements, 4-1
  imaging assembly, 4-1
  lower FAZ trap, 4-4
  processor drum, 4-5
  upper FAZ trap, 4-3
resetting the preventive maintenance count and changing the service history, 3-33
RF tag, G-2

S

seismic kit installation, 2-12
service image, G-2
shut down, G-2
site checklist, 2-14
site specifications, 2-10
size and weight, 2-5
SMPTE test pattern, G-2
sorter, film, 2-3
space requirements, 2-10
specifications
  acoustic noise, 2-7
  film drawers, 2-7
  film throughput, 2-7
  floor vibration, 2-7
  heat output, 2-6
  image size and orientation, 2-8
  laser, 2-6
  power, 2-6
  power consumption, 2-6
  power supply, 2-6
  site specifications, 2-10
  size and weight, 2-5
  warmup time, 2-7
status screen, 5-1
storage environment, 2-13
support information, 6-1

T

throughput, film, 2-7
transport, film, 2-2
troubleshooting
  clearing film jams, 5-21
  drawers and door override latches, 5-22
  manually closing film cartridge, 5-23
  status and error messages, 5-1

U

undelivered queue, G-2
upper FAZ trap, 4-3

V

version, G-2
vibration, floor, 2-7

W

warmup time, 2-7
weight and size, 2-5

Eastman Kodak Company
343 State Street
Rochester, NY 14650

Kodak and DryView are trademarks of Eastman Kodak Company.
© Eastman Kodak Company, 2004